EMF110A

Fastener Systems for Heavy-Duty Applications

FLEXCO

Flexible Steel Lacing Company

Welcome to Flexco

Companies from coal mines to distribution centers turn to Flexco for belt conveyor fasteners and maintenance solutions that help maximize uptime, productivity, and safety. We offer the most comprehensive selection of quality products in the industry. And we back customers with product and application support second to no one.

The support you need, when and where you need it

Flexco products are available through a select network of qualified belting and industrial supply distributors. This worldwide distributor network means we can back our customers with product and application support from locations around the globe.

From fastener selection and installation to troubleshooting, our distributors are equipped and trained to respond to both your day-to-day and emergency needs. Rely on Flexco and Flexco distributors for a broad range of belt conveyor maintenance solutions and unsurpassed product support.

www.flexco.com

For up-to-the-minute information on products, applications, and distributors – as well as late-breaking news and product bulletins – visit our Web site. You'll find links to:

- *Products*
- *Specification Guidelines*
- *On-line Catalog*
- *Technical Support*
- *Application Stories*
- *Frequently Asked Questions (FAQs)*
- *Product Literature*
- *Global Sales & Distribution Facilities*

You'll also find helpful links to industry trade show sites.

Mechanical Fastener Solutions from Flexco

The most respected name in belt conveyor solutions is Flexco. And for a simple reason. Flexco products set the industry's highest standards for design, ease of installation and reliability. Plus, knowledgeable advice and proven solutions help our customers keep conveyor efficiency high and operation costs low.

Flexco fastener systems for heavy-duty applications

Bolt Solid Plate Fastener System
Pages 4-9

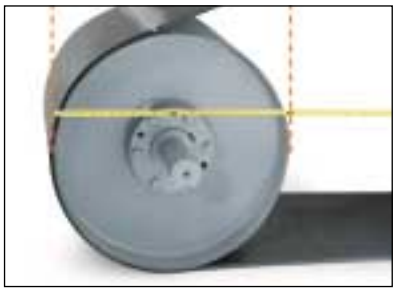
Bolt Hinged Fastener System
Pages 10-15

SR™ Rivet Hinged Fastener System
Pages 16-22

Belt Maintenance Products
Pages 23-24

Belt Conveyor Products
Pages 25-27
(Positioners, Belt Plows & Skirt Clamps)

How to specify the right Flexco fastener



1. **Determine belt tension.**
   Most conveyor belting has a mechanical fastener rating. Care should be taken not to operate the belting or fasteners beyond their recommended ratings.
2. **Measure belt thickness.**
   If fasteners are to be countersunk, measure the belt thickness after a portion of the belt cover has been removed. Choose a fastener size which corresponds to belt thickness.
3. **Measure the diameter of the smallest pulley in your drive.**
   For tail or take-up of the self-cleaning "wing" type pulley, 25% larger diameter dimensions are generally required. Only consider pulleys over which the belt makes at least a 90° wrap.
4. **Choose the fastener size that is appropriate for your specifications.**
   Consult individual Flexco application catalogs to guide your selection.
5. **Hinged or solid plate?**
   When either style is appropriate, solid plate styles are preferred for longer life and to prevent sifting. Hinged fasteners are preferred on portable conveyors and on conveyors with smaller pulley diameters.

Fastener metals

Steel: For most applications, plated steel helps combat mild corrosion.

RustAlloy®: Resists corrosion due to mine water exposure or other chemical attack.

Stainless Steel: Type 316 stainless steel for resistance to abrasion, magnetic attraction, and corrosion.

Everdur: Spark-free copper and silicon alloy for use in grain elevators and other potentially explosive environments.

MegAlloy®: Superior resistance to wear and abrasion. Provides several times the service life of steel.

Promal: Heat-treated, malleable castings for superior abrasion resistance in corrosive environments.

Flexco® Bolt Solid Plate Fastener System

Flexco® Bolt Solid Plate fasteners are engineered to meet the demands of the toughest material-handling applications. They can be applied to belts mechanically rated up to 105 kN/m (620 P.I.W.), and are commonly used for highly abrasive materials such as sand, gravel, and crushed stone, as well as coal, cement, and salt.

Superior strength

Bolt Solid Plate fasteners provide a strong, sift-free splice with superior holding ability. The strength of this fastener is derived from the compression of the plates mounted above and below the belts, with high tensile strength bolts. The bolts compress top and bottom plates to distribute splice tension evenly across the entire width of each fastener plate. For added strength and pull-out resistance, specially formed teeth penetrate deep into the belt carcass – without damaging the carcass fibers.

No. 3, our largest, for belts 24 mm (15/16") thick or more.

No. 1, our smallest, for belts from 5 mm (3/16") to 11 mm (7/16") thick.

Easy installation

Specially designed templets, punches and boring tools make it easy to quickly and accurately punch holes into belts. Fasteners can then be installed on site using portable hand or power tools.

The exclusive Flexco piloted bolt speeds installation. The piloted bolt tip cradles nuts securely in place, and simplifies installation by automatically aligning the bolt and nut threads.

New Quick-Fit™ Pre-Assemblies for Fast Installation

Twin mounting bolts, built into each bottom plate, simplify handling and positioning beneath the belt for faster installation. Additional features include:

- *Piloted bolt tips for easier nut placement*
- *Deeper leading-edge coining for improved cleaner and diverter compatibility*
- *Sharper gripping teeth for superior belt cover penetration*

Flexco® Bolt Solid Plate Fastener Selection Guide

Fastener Size	Belt Thickness Range		For Belts with Mechanical Fastener Ratings Up To:		Recommended Minimum Pulley Diameter *(Operating Tension 75% -100% of Belt Rating)*	
	mm	in.	kN/m	P.I.W.	mm	in.
1	5-11	3/16-7/16	30	150	300	12
140	5-11	3/16-7/16	40	225	350	14
190	8-14	5/16-9/16	60	330	450	18
1-1/2	11-17	7/16-11/16	50	300	450	18
2	14-21	9/16-13/16	75	440	750	30
2-1/4	14-30	9/16-1-3/16	105	620	900	36
2-1/2	19-25	3/4-1	75	450	1050	42
3	24 & over	15/16 & over	100	560	1200	48

90° splice for standard bulk conveyors

The conventional 90° splice is the most commonly used splice pattern for standard troughing and non-troughing bulk conveyors. It requires the fewest fasteners and is the easiest and quickest to install. Whenever pulley diameters allow, this is the preferred splice pattern.

45° splice for use with smaller pulleys

A 45° splice can be installed in situations where conveyor pulley diameters are as much as 25% smaller than the recommended size for 90° splices. This angled splice distributes tension over a greater belt area. The 45° splice passes more smoothly over pulleys and under cleaners. Cleaner blade life can be extended even more by skiving the 45° splice.

Recessed Bolt Solid Plate

When belt top covers are 4,8 mm (3/16") or more, we recommend countersinking (or recessing) fastener plates. Countersinking permits deeper penetration of fastener teeth into the carcass. This reduces plate exposure and extends splice life. Countersinking also contributes to reduced noise on return idlers. And because countersinking reduces the effective thickness of the belt, smaller fasteners may be used in applications employing smaller pulley diameters.

Flexco® Bolt Solid Plate

Additional Splice Patterns

Rip Repair

Use standard Flexco® Bolt Solid Plate fasteners to repair conveyor belt edge tears and holes.

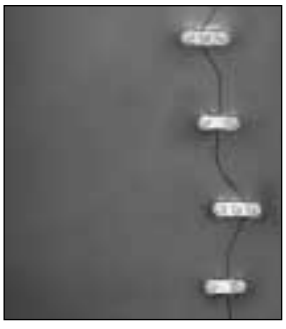
For jagged lengthwise conveyor belt tears, standard Bolt Solid Plate fasteners can be combined with the three-bolt Rip Plate fasteners. Each is installed alternately, across the entire length of the rip, as displayed in the photo at right. Three-bolt Rip Plate fasteners can also be used to bridge "soft" spots in the belt before they become rips.

Rip Repair Selection Information

Belt Thickness		Fastener Size
mm	in.	
6-13	1/4-1/2	RP1
10-21	3/8-13/16	RP2
14-30	9/16-1-3/16	2-1/4

Rip Repair Fasteners

Ordering Number	Box Qty.
Steel	
RP1E	25
RP1C	100
RP2E	25
RP2C	100
2-1/4E	25
2-1/4C	100
Stainless	
RP1ES	25
RP2ES	25
2-1/4ES	25
Everdur	
2-1/4EE	25



Three-bolt Rip Plate fasteners are extra-long and should be installed crosswise to the longitudinal rip. Two bolts should be attached to the "flap" side of the belt tear.

Wedlok® High Tension Splice

Wedlok® splices cost substantially less than a vulcanized splice, take considerably less installation time, and can be installed by your own maintenance crews on belts with mechanical fastener ratings up to 123 kN/m (700 P.I.W.).

The Wedlok splice requires standard No. 2 Bolt Solid Plate fasteners, and the Wedlok Kit consisting of a special tip, chevron, and tail fasteners. A set of three Wedlok templets is also required.

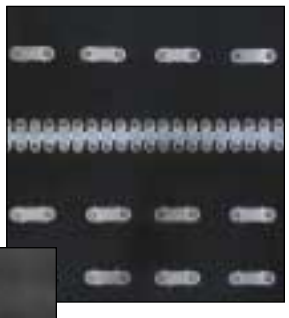
Description	Ordering Number
Splice Kit*	2W
Stainless Splice Kit	2WS
Leading End Kit	2WL
Trailing End Kit	2WT
Templet Set	T2W
1800 mm Side Templet	T2WS72

**Stainless Top Plates, Balance Steel.*

90° Splice for Bucket Elevator Belts

The standard 90° splice is recommended for most elevator belts. Bolt Solid Plate fasteners provide a smooth underside on the belt, protecting pulley bearings and lagging from the pounding resulting from bolted over-lap splices. The splice delivers tensile strength equal to that of a lap joint. And it can be made in confined spaces. For extremely heavy jobs, 35% greater strength than a lap joint can be obtained by adding a splice pad constructed from all-nylon conveyor belt carcass material.

Refer to page 7 for ordering standard Flexco fasteners.



Selection Charts

Fasteners

One "E" box contains 25 complete fastener sets. A set consists of a top plate, a bottom plate, two nuts, two bolts, and an assembly clip.

"E" Box (25 Fastener Sets)

Ordering Number							
Steel	**MegAlloy® Top & Bottom Plates, Steel Bolts & Nuts**	**Stainless – 300 Series**	**Everdur**	**Promal Top Plates Balance Steel**	**MegAlloy® Top Plates Balance Steel**	**300 Series Stainless Top Plates Balance Steel**	**3 mm Rubber-Covered Top Plates Balance Steel**
1E							
140E	140EMAP	140ES	140EE	140EP	140EMA	140EST	
190E	190EMAP	190ES	190EE		190EMA	190EST	190ERCT
1-1/2E	1-1/2EMAP	1-1/2ES	1-1/2EE	1-1/2EP	1-1/2EMA	1-1/2EST	1-1/2ERCT
2E	2EMAP	2ES	2EE	2EP	2EMA	2EST	2ERCT
2-1/4E	2-1/4EMAP	2-1/4ES	2-1/4EE		2-1/4EMA	2-1/4EST	2-1/4ERCT
2-1/2*							
3*							

**10 Fastener Sets*

"C" Bucket

(100 Fastener Sets – Bottom Plates Pre-Assembled)

Ordering Number		
Steel	**MegAlloy® Top Plates Balance Steel**	**MegAlloy® Top & Bottom Plates, Steel Bolts & Nuts**
1C		
140C	140CMA	140CMAP
190C	190CMA	190CMAP
1-1/2C	1-1/2CMA	1-1/2CMAP
2C	2CMA	2CMAP
2-1/4C	2-1/4CMA	
2-1/2C*		
3C*		

** Packaged in Cartons*

NOTE: Stainless and Everdur fastener sets are also available in "C" buckets.

Fastener Sets Required For A Complete Joint

Belt Width		**Fastener Size 1, 140 & 190**				**Fastener Size 1-1/2, 2 & 2-1/4**				**Fastener Size 2-1/2 & 3**			
		90°		**45°**		**90°**		**45°**		**90°**		**45°**	
mm	**in.**	**mm**	**in.**	**mm**	**in.**	**mm**	**in.**	**mm**	**in.**	**mm**	**in.**	**mm**	**in.**
300	12	9	10	12	12	8	8	10	9	6	6	7	7
450	18	14	15	19	19	11	12	15	15	9	9	12	12
600	24	19	20	26	26	15	16	21	21	13	13	16	17
750	30	24	25	33	33	19	20	27	27	16	16	21	21
900	36	29	30	40	41	23	24	32	33	19	19	26	26
1000		32		45		26		36		21		29	
1050	42	34	35	47	48	27	28	38	39	21	22	30	31
1200	48	39	40	54	55	31	32	43	44	26	26	35	35
1350	54	44	45	61	63	35	36	49	48	29	29	40	40
1500	60	49	50	68	69	39	40	55	56	32	32	44	44
1800	72	59	60	82	83	47	48	65	68	39	39	53	53

To maximize fastener service life, see page 3 to select the fastener metal for your application.

Extra Piloted Bolts (100 per Box)

For Fastener Number	**Ordering Number**		
	Steel	**Stainless – 300 Series**	**Everdur**
1	20391		
140 & 190	20399	20400	20397
RP1	20398		20397
1-1/2	20402	20407	20409
2 & RP2	20406	20407	20409
2-1/4	20410	20411	20412
2-1/2 & 3	20414		

Extra Nuts (100 per Box)

For Fastener Number	**Ordering Number**		
	Steel	**Stainless – 300 Series**	**Everdur**
1, 140, 190 & RP1	20377	20381	20387
1-1/2, 2 2-1/4 & RP2	20378	20382	20388
2-1/2 & 3	20379		

Flexco® Bolt Solid Plate

Installation Tools and Supplies

The only tools needed for Bolt Solid Plate fastener installation are a templet and portable hand or power tools such as wrenches and belt punches. Impact wrench-driven power tools are recommended since they can speed installation time by at least 50%.

Hand Installation Tools

Description	For Fastener Number	Ordering Number
Bolt Horn		2BH
Punch	1, 140, 190 & RP1	P1P
	1-1/2, 2, 2-1/4 & RP2	P2P
	2-1/2 & 3	P3P
Boring Bit	1, 140, 190 & RP1	B1B
	1-1/2, 2, 2-1/4 & RP2	B2B
	2-1/2 & 3	B3B
Wrench	1, 140, 190 & RP1	S1S
	1-1/2, 2, 2-1/4 & RP2	S2S
	2-1/2 & 3	S3S

Power Installation Tools

Description	For Fastener Number	Ordering Number
Power Punch	1, 140, 190 & RP1	HP1
	1-1/2, 2, 2-1/4 & RP2	HP2
	2-1/2 & 3	HP3
Power Boring Bit	1, 140, 190 & RP1	HB1
	1-1/2, 2, 2-1/4 & RP2	HB2
	2-1/2 & 3	HB3
Power Wrench	1, 140, 190 & RP1	HW1
	1-1/2, 2, 2-1/4 & RP2	HW2
	2-1/2 & 3	HW3
Quick Change Chuck		5552

Bolt Breaker

Description	For Fastener Number	Ordering Number
Bolt Breaker (Two Per Package)	1, 140, 190 & RP1	110
	1-1/2, 2, 2-1/4 & RP2	112
	2-1/2 & 3	113

Bolt Breaker

Flexco-Lok® Tape

Flexco-Lok® Tape is a rigid nylon tape that helps eliminate belt ripple on plied or solid-woven belting, so belts run smoothly over pulleys and under cleaners. Also helps seal the splice against seepage of fines and moisture.

Fastener Size	Ordering Number
1 & 140	FL7C
190, 1-1/2 2 & 2-1/4	FL11C

Belt Tape: 30 m (100') per Carton

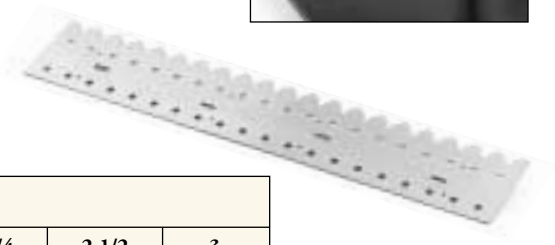
Flexco® Cracking Chisel

With a hammer and cracking chisel, worn top plates can be easily replaced without resorting to replacement of the entire splice.

Nut Size	Ordering Number
1, 140 & 190	C1C
1-1/2, 2 & 2-1/4	C2C

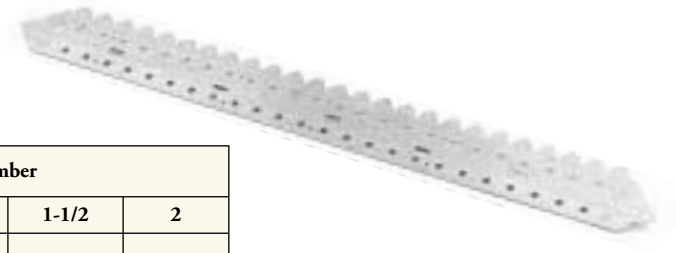
90° and 45° Templets

Templets for Bolt Solid Plate fastener installation are required for 90° or 45° splice applications. Templets simplify installation by providing an accurate guide for precise placement of bolt holes. Lengths for all standard belt widths are available.



90° Templets

Belt Width		Ordering Number							
mm	**in.**	**1**	**140**	**190**	**1-1/2**	**2**	**2-1/4**	**2-1/2**	**3**
300	12	1-12	140-12	190-12	1-1/2-12	2-12			
350	14	1-14	140-14	190-14					
400	16	1-16	140-16	190-16					
450	18	1-18	140-18	190-18	1-1/2-18	2-18			
500	20	1-20	140-20	190-20	1-1/2-20			2-1/2-20	
600	24	1-24	140-24	190-24	1-1/2-24	2-24	2-1/4-24	2-1/2-24	
650	26			190-26					
700	28			190-28					
750	30	1-30	140-30	190-30	1-1/2-30	2-30	2-1/4-30	2-1/2-30	
900	36	1-36	140-36	190-36	1-1/2-36	2-36	2-1/4-36	2-1/2-36	3-36
1050	42	1-42	140-42	190-42	1-1/2-42	2-42	2-1/4-42	2-1/2-42	3-42
1200	48	1-48	140-48	190-48	1-1/2-48	2-48	2-1/4-48	2-1/2-48	3-48
1350	54				1-1/2-54	2-54	2-1/4-54	2-1/2-54	
1500	60				1-1/2-60	2-60	2-1/4-60	2-1/2-60	3-60
1800	72				1-1/2-72	2-72	2-1/4-72	2-1/2-72	3-72



45° Templets

Belt Width		Ordering Number				
mm	**in.**	**1**	**140**	**190**	**1-1/2**	**2**
300	12	1-12-45				
450	18	1-18-45		190-18-45	1-1/2-18-45	
600	24	1-24-45	140-24-45	190-24-45	1-1/2-24-45	2-24-45
750	30	1-30-45	140-30-45	190-30-45	1-1/2-30-45	2-30-45
900	36	1-36-45	140-36-45	190-36-45	1-1/2-36-45	2-36-45
1050	42		140-42-45	190-42-45	1-1/2-42-45	2-42-45
1200	48	1-48-45	140-48-45	190-48-45	1-1/2-48-45	
1500	60		140-60-45	190-60-45	1-1/2-60-45	2-60-45

Flexco® Bolt Hinged Fastener System

For belts operating over smaller pulleys – such as in construction equipment and road machinery – Flexco® Bolt Hinged fasteners are strong, dependable, and easy-to-install.

Designed as a compression fastener, Bolt Hinged is fastened to the belt ends with high tensile strength bolts. These compress the plates in the belt cover. Additional holding capability is provided by the fastener teeth that inbed in the belt without damage to the belt carcass. So splice tension is distributed across the entire plate width and teeth secure the fastener to resist pull-out.

No. 375X *No. 550*

Application versatility

Hinged construction makes Bolt Hinged fasteners ideal for many types of machinery that use smaller pulleys but still require a high-strength splice. And for applications requiring frequent belt-length alterations, the joint can be separated simply by removing the hinge pin.

Easy installation

On-site installation requires only portable hand or power tools. A specially designed templet and boring tool or belt punch quickly and accurately punches bolt holes into belts. Installation is also simplified by our exclusive piloted bolt. Tapered bolt tips cradle nuts securely in place and eliminate the need to twist nuts onto bolts by hand during installation set-up.

Flexco® Bolt Hinged Fastener Selection Guide

Fastener Size	Belt Thickness Range		For Belts with Mechanical Fastener Ratings Up To:		Recommended Minimum Pulley Diameter *(Operating Tension 75% -100% of Belt Rating)*	
	mm	in.	kN/m	P.I.W.	mm	in.
375X	6-11	1/4-13/32	33	190	150	6
550	6-16	1/4-5/8	52	300	225	9

Selection Charts

"J" carton complete fastener joint

Each "J" carton includes one complete belt joint for belt widths ranging from 300 mm (12") to 1500 mm (60"). Cartons include:

- 2 Fastener Strips
- 1 Hinge Pin
- Filler Tubing
- 1 Gauge Pin
- 2 Hinge Pin Washers
- Required Piloted Bolts, Nuts, Clips

375X Fasteners

Belt Width		Ordering Number					
mm	in.	NC Steel Joint with Nylon Covered Steel Cable *	NCS Steel Joint with Nylon Covered Stainless Cable *	SC Steel Joint with Bare Steel Cable *	SSC Stainless Joint with Bare Stainless Cable **	NCS Stainless Joint with Nylon Covered Stainless Cable **	NB Everdur Joint with Nylon Covered Bronze Cable ***
300	12	375XJ12NC					
350	14	375XJ14NC					
400	16	375XJ16NC					
450	18	375XJ18NC	375XJ18NCS			375XSJ18NCS	375XEJ18NB
500	20	375XJ20NC					
600	24	375XJ24NC	375XJ24NCS	375XJ24SC	375XSJ24SSC	375XSJ24NCS	375XEJ24NB
650	26	375XJ26NC					
750	30	375XJ30NC	375XJ30NCS		375XSJ30SSC	375XSJ30NCS	375XEJ30NB
900	36	375XJ36NC	375XJ36NCS	375XJ36SC	375XSJ36SSC	375XSJ36NCS	375XEJ36NB
1050	42	375XJ42NC	375XJ42NCS		375XSJ42SSC	375XSJ42NCS	375XEJ42NB
1200	48	375XJ48NC	375XJ48NCS	375XJ48SC	375XSJ48SSC	375XSJ48NCS	
1500	60	375XJ60NC			375XSJ60SSC		

550 Fasteners

Belt Width		Ordering Number						
mm	in.	NC Steel Joint with Nylon Covered Steel Cable *	NCS Steel Joint with Nylon Covered Stainless Cable *	SC Steel Joint with Bare Steel Cable *	SSC Steel Joint with Bare Stainless Cable *	NAC Steel Joint with Nylon Covered Armored Cable *	NCS Stainless Joint with Nylon Covered Stainless Cable **	MA MegAlloy® Joint with Bare Stainless Cable ***
450	18	550J18NC					550SJ18NCS	550MAJ18SSC
500	20	550J20NC						
600	24	550J24NC	550J24NCS	550J24SC	550J24SSC	550J24NAC	550SJ24NCS	550MAJ24SSC
650	26	550J26NC						
750	30	550J30NC	550J30NCS	550J30SC	550J30SSC	550J30NAC	550SJ30NCS	550MAJ30SSC
900	36	550J36NC	550J36NCS	550J36SC	550J36SSC	550J36NAC	550SJ36NCS	550MAJ36SSC
1050	42	550J42NC	550J42NCS	550J42SC	550J42SSC	550J42NAC	550SJ42NCS	550MAJ42SSC
1200	48	550J48NC	550J48NCS	550J48SC	550J48SSC	550J48NAC	550SJ48NCS	550MAJ48SSC
1350	54	550J54NC				550J54NAC		
1500	60	550J60NC					550SJ60NCS	

* *"J" CARTON – Continuous Strip w/Steel Nuts & Bolts*

** *"J" CARTON – Continuous Strip w/Stainless Nuts & Bolts*

*** *"J" CARTON – Individual Plates w/Steel Nuts & Bolts*

To maximize fastener service life, see page 3 to select the fastener metal for your application.

Flexco® Bolt Hinged

Selection Charts

Bulk fasteners

Bulk cartons include individual fastener plates, piloted bolts and nuts. Choose cartons containing 50 sets of single-bolt fasteners, 25 sets of two-bolt fasteners, or 18 sets of three-bolt fasteners.

Note: When ordering bulk fastener sets, hinge pins and plastic filler tubing must be ordered separately.

Description	Ordering Number	
	Per Set	Per Container
Steel		
Two-Plate Fastener	375X-2STS	375X-2
Three-Plate Fastener	375X-3STS	375X-3
Single-Plate Fastener	550-1STS	550-1
Three-Plate Fastener	550-3STS	550-3
Stainless 300 Series		
Two-Plate Fastener	375XS-2STS	375XS-2
Three-Plate Fastener	375XS-3STS	375XS-3
Single-Plate Fastener	550S-1STS	550S-1
MegAlloy®		
Single-Plate Fastener		550MA-1

With Bolts & Nuts

Extra piloted bolts and nuts

Replacement piloted bolts and nuts are packaged separately, 100 per box.

Extra Piloted Bolts

For Fastener Number	Ordering Number		
	Steel	Stainless – 300 Series	Everdur
375	20398	20400	20397
550	20399	20400	20397

Extra Nuts

For Fastener Number	Ordering Number		
	Steel	Stainless – 300 Series	Everdur
375X	20380	20381*	20387*
550	20380	20381*	20387*

**Slotted Nuts*

Plastic filler tubing reduces sifting

Flexco Plastic Filler Tubing is furnished in all "J" cartons, and keeps sifting of fine materials through the hinged joint to a minimum. It is included with every "J" carton and is sold by the 30 m (100-foot) reel.

Description	Quantity	Ordering Number
375X & 550	30 m (100')/Pkg.	30894

Extra Hinge Pins

Extra Hinge Pins

For 375X and 550

Belt Width		Ordering Number									
		AC (6 mm dia.) Bare Armored Cable		ACS (7 mm dia.) Bare Armored Stainless Cable		NAC (6 mm dia.) Nylon Covered Armored Cable		NC (6 mm dia.) Nylon Covered Steel Cable		NCS (6 mm dia.) Nylon Covered Stainless Cable*	
mm	in.	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)
300	12							NC-12-1	NC-12		NCS-12
350	14							NC-14-1	NC-14		NCS-14
400	16							NC-16-1	NC-16		NCS-16
450	18	AC-18-1	AC-18			NAC-18-1	NAC-18	NC-18-1	NC-18		NCS-18
500	20							NC-20-1	NC-20		NCS-20
600	24	AC-24-1	AC-24			NAC-24-1	NAC-24	NC-24-1	NC-24	NCS-24-1	NCS-24
650	26	AC-26-1	AC-26			NAC-26-1	NAC-26		NC-26		
750	30	AC-30-1	AC-30	ACS-30-1	ACS-30	NAC-30-1	NAC-30	NC-30-1	NC-30	NCS-30-1	NCS-30
900	36	AC-36-1	AC-36	ACS-36-1	ACS-36	NAC-36-1	NAC-36	NC-36-1	NC-36	NCS-36-1	NCS-36
1050	42	AC-42-1	AC-42	ACS-42-1	ACS-42	NAC-42-1	NAC-42	NC-42-1	NC-42	NCS-42-1	NCS-42
1200	48	AC-48-1	AC-48	ACS-48-1	ACS-48	NAC-48-1	NAC-48	NC-48-1	NC-48	NCS-48-1	NCS-48
1350	54	AC-54-1		ACS-54-1	ACS-54	NAC-54-1	NAC-54	NC-54-1	NC-54	NCS-54-1	NCS-54
1500	60	AC-60-1		ACS-60-1	ACS-60	NAC-60-1	NAC-60	NC-60-1	NC-60	NCS-60-1	NCS-60
1800	72	AC-72-1				NAC-72-1	NAC-72	NC-72-1	NC-72	NCS-72-1	NCS-72

** 300 Series*

Hinge pin material selection

AC – Bare Armored Cable: *Heavy-duty, long-wearing pin popular in underground mining applications. Armor wrapping protects interior wires.*

ACS – Bare Armored Stainless Steel Cable: *The same advantages as bare armored cable plus corrosion resistance.*

NAC – Nylon Covered Armored Cable: *Combines a durable armored steel wrap with a nylon covering for smooth operation and long service life. Nylon covering prevents pin migration. Not recommended in wet, abrasive applications.*

NC – Nylon Covered Steel Cable: *Nylon covering prevents pin migration. Not recommended in wet, abrasive applications.*

NCS – Nylon Covered Stainless Steel Cable: *For greater corrosion resistance. Not recommended in wet, abrasive applications.*

SC – Bare Steel Cable: *Recommended for abrasive or gritty material conveyance.*

SSC – Bare 300 Series Stainless Steel Cable: *For conditions where corrosion attacks steel pins.*

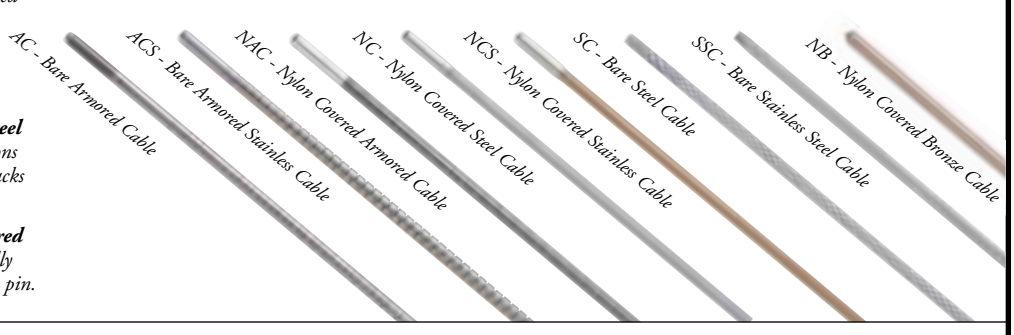
NB – Nylon Covered Bronze Cable: *Fully non-magnetic hinge pin.*

Extra Hinge Pins

For 375X and 550

Belt Width		Ordering Number					
		SC (6 mm dia.) Bare Steel Cable		SSC (6 mm dia.) Bare Stainless Cable*		NB (6 mm dia.) Nylon Covered Bronze Cable	
mm	in.	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)
450	18					NB-18-1	
600	24	SC-24-1	SC-24	SSC-24-1	SSC-24	NB-24-1	
650	26		SC-26				
750	30	SC-30-1	SC-30	SSC-30-1	SSC-30	NB-30-1	
900	36	SC-36-1	SC-36	SSC-36-1	SSC-36	NB-36-1	
1050	42	SC-42-1	SC-42	SSC-42-1	SSC-42	NB-42-1	
1200	48	SC-48-1	SC-48	SSC-48-1	SSC-48		

** 300 Series*


AC - Bare Armored Cable
ACS - Bare Armored Stainless Cable
NAC - Nylon Covered Armored Cable
NC - Nylon Covered Steel Cable
NCS - Nylon Covered Stainless Cable
SC - Bare Steel Cable
SSC - Bare Stainless Steel Cable
NB - Nylon Covered Bronze Cable

Flexco® Bolt Hinged

Installation Tools and Supplies

The only tools needed for Bolt Hinged fastener installation are the hand and power tools described here, and the Flexco Bolt Hinged Curved Templet.

Hand Installation Tools

Description	For Fastener Number	Ordering Number
Punch	375X & 550	P1P
Boring Bit	375X & 550	B1B
Wrench	375X & 550	100*
		S1S**

** For use with Steel No. 375X or Steel No. 550 nuts.*
*** For use with Stainless No. 375X or Stainless No. 550 nuts.*

Power Installation Tools

Description	For Fastener Number	Ordering Number
Power Punch	375X & 550	HP1
Power Boring Bit	375X & 550	HB1
Power Wrench	375X & 550	H100*
		HW1**
Quick Change Chuck	375X & 550	5552

** For use with Steel No. 375X or Steel No. 550 nuts.*
*** For use with Stainless No. 375X or Stainless No. 550 nuts.*

Bolt Breaker

Description	For Fastener Number	Ordering Number
Bolt Breaker (Two Per Package)	375X & 550	110

Flexco® Cracking Chisel

With a hammer and cracking chisel, worn top plates can be easily replaced without resorting to replacement of the entire splice.

Nut Size	Ordering Number
1, 140 & 190	C1C
1-1/2, 2 & 2-1/4	C2C

Curved Templets

The curved templet is required to ensure accurate placement of punched or drilled holes. Exclusive concave cut made with Flexco® Bolt Hinged templets provides uniform tension across full belt end and reduces the potential for splice edge failure. Templets are available in all standard belt widths.

Belt Width		Ordering Number	
mm	in.	375X	550
300	12	375X-12	512
350	14	375X-14	
400	16	375X-16	516
450	18	375X-18	518
500	20	375X-20	520
600	24	375X-24	524
650	26	375X-26	526
750	30	375X-30	530
900	36	375X-36	536
1050	42	375X-42	542
1200	48	375X-48	548
1350	54	375X-54	554
1500	60	375X-60	560
1800	72	375X-72	572

NOTE: All templets up to and including 1800 mm (72") are curved. For belt widths over 1800 mm (72"), straight templet supplied.

Alligator® 400 Series Curved Belt Cutter

For even tension distribution across the entire width of the belt, belt cuts must be made in a concave shape. The Alligator® Curved Belt Cutter is used to cut belts for Flexco Hinged Fasteners and makes it easy to cut the precise curve necessary to equalize belt tension.

Description	Belt Width		Ordering Number
	mm	in.	
Cutter Complete	750	30	400430
	900	36	400436
	1050	42	400442
	1200	48	400448
	1500	60	400460

NOTE: Belt widths over 1800 mm (72") require straight cutters.

Flexco® SR™ Scalloped Edge™ Fastener System

Lower fastener profile extends splice life and improves performance

The Flexco® SR™ Scalloped Edge™ fastener features a low profile that significantly reduces the fastener's exposure to cleaner blades, skirt rubber, and return idlers. Reduced wear and tear on the fastener extends the life of the splice to maximize belt availability and to help keep productivity on a roll.

Designed for rubber plied and PVC solid woven belting, and for worn belts unfit for vulcanized splices, the Flexco SR fastener features a patented Scalloped Edge design. The scalloped design contributes to improved fastener profile resulting in increased compatibility with belt cleaners and improved cleaner-tip wear. The staggered rivet pattern also provides maximum holding ability by allowing the rivets to pass between the carcass fibers without damaging them.

A built-in viewport (see photo at right) simplifies fastener positioning. And self-setting rivets are installed from the top side of the belt for faster installation.

- Lower fastener profile extends belt splice life.
- Less effort required for installation.
- Reduces maintenance costs.
- Viewport assures proper installation alignment.

How Flexco® SR™ Scalloped Edge™ Fasteners Work

R2

R5

The SR™ (Self-Setting Rivet) Fastener utilizes staggered pattern, multiple rivet attachments that pass between carcass fibers without severing them. The specially shaped head of each pilot nail works in conjunction with the installation tool anvil plate to set the rivets. The same hammer blows that set the rivets also compress the fastener plates into the belt covers. This provides maximum holding ability and distributes splice tension evenly across the width of the belt.

Flexco® SR™ Scalloped Edge™ Fastener Selection Guide

Fastener Size	Belt Thickness Range		For Belts with Mechanical Fastener Ratings Up To:		Recommended Minimum Pulley Diameter *(Operating Tension 75% -100% of Belt Rating)*	
	mm	in.	kN/m	P.I.W.	mm	in.
R2	3-10	1/8-3/8	60	330	125	5
R5	6-11	7/32-7/16	79	450	230	9
R5-1/2	8-15	5/16-19/32	114	650	300	12
R6	10,5-17	13/32-11/16	140	800	450	18
RAR6LP	8-18	5/16-23/32	140	800	450	18
RAR8	10,5-17	13/32-11/16	263	1500	450	18

R2

Unique two teeth/two rivet combination offers highest efficiencies in strength and durability for medium-duty applications.

R5

Ideal for applications such as wood processing or construction equipment with smaller pulleys as well as for underground mining.

R5-1/2

Midsize R5-1/2 is ideal as an upgrade for R5 or in applications where pulley size prohibits the use of R6.

R6

Can be used in certain applications up to 210 kN/m (1200 P.I.W.) with R6 RustAlloy® and stainless steel rivets. Contact Flexco Marketing/ Engineering department for details.

RAR6LP

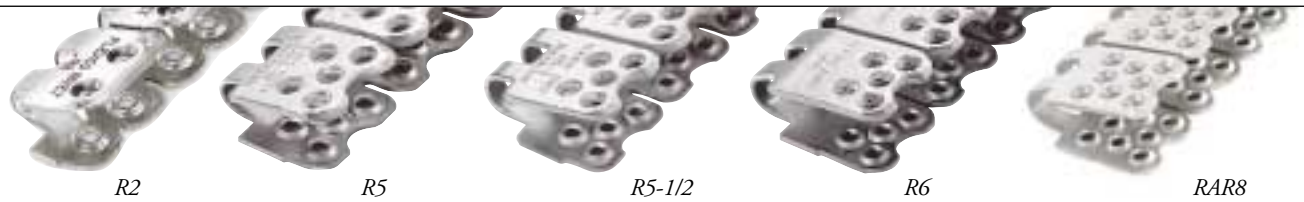
Features lower fastener profile for improved compatibility with cleaner blades, skirt rubber and return idlers.

RAR8

Eight-rivet pattern designed for use on mainline and panel belts with mechanical fastener ratings up to 263 kN/m (1500 P.I.W.). For questions regarding RAR8 and your application, contact the Flexco Marketing or Engineering department.

Flexco® SR™ Scalloped Edge™

Selection Charts



R2 *R5* *R5-1/2* *R6* *RAR8*

Use the charts below to match the Flexco® SR™ Scalloped Edge™ fasteners to your needs. Find the fastener metal type required for your application. Then choose the ordering number that corresponds to your belt's width.

Flexco® R2 (Two fastener strips per package)

Belt Width		Ordering Number		Rivets Required For One Joint
mm	in.	Steel	Stainless 300 Series	
300	12	R2-12/300	R2S-12/300	24
450	18	R2-18/450	R2S-18/450	40
600	24	R2-24/600	R2S-24/600	52
750	30	R2-30/750	R2S-30/750	64
900	36	R2-36/900	R2S-36/900	80
1050	42	R2-42/1050	R2S-42/1050	92
1200	48	R2-48/1200	R2S-48/1200	108
1350	54	R2-54/1350	R2S-54/1350	120
1500	60	R2-60/1500	R2S-60/1500	136

Flexco® Scalloped Edge™ R5 (Two fastener strips per package)

Belt Width		Ordering Number			Rivets Required For One Joint
mm	in.	Steel	Stainless 300 Series	RustAlloy® 400 Series SS	
450	18	R5-SE-18/450	R5S-SE-18/450		100
600	24	R5-SE-24/600	R5S-SE-24/600	RAR5-SE-24/600	130
650	26	R5-SE-26/650		RAR5-SE-26/650	140
750	30	R5-SE-30/750	R5S-SE-30/750	RAR5-SE-30/750	160
900	36	R5-SE-36/900	R5S-SE-36/900	RAR5-SE-36/900	200
1050	42	R5-SE-42/1050	R5S-SE-42/1050	RAR5-SE-42/1050	230
1200	48	R5-SE-48/1200	R5S-SE-48/1200	RAR5-SE-48/1200	270
1350	54	R5-SE-54/1350		RAR5-SE-54/1350	300
1500	60	R5-SE-60/1500	R5S-SE-60/1500	RAR5-SE-60/1500	340
1800	72	R5-SE-72/1800			410

Flexco® Scalloped Edge™ R5-1/2

(Two fastener strips per package)

Belt Width		Ordering Number		Rivets Required For One Joint
mm	in.	Steel	RustAlloy® 400 Series SS	
450	18	R5-1/2-SE-18/450		100
600	24	R5-1/2-SE-24/600	RAR5-1/2-SE-24/600	130
750	30	R5-1/2-SE-30/750	RAR5-1/2-SE-30/750	160
900	36	R5-1/2-SE-36/900	RAR5-1/2-SE-36/900	200
1050	42	R5-1/2-SE-42/1050	RAR5-1/2-SE-42/1050	230
1150	46		RAR5-1/2-SE-46/1150	260
1200	48	R5-1/2-SE-48/1200	RAR5-1/2-SE-48/1200	270
1350	54	R5-1/2-SE-54/1350	RAR5-1/2-SE-54/1350	300
1500	60	R5-1/2-SE-60/1500	RAR5-1/2-SE-60/1500	340
1800	72	R5-1/2-SE-72/1800	RAR5-1/2-SE-72/1800	410

Flexco® Scalloped Edge™ R6 and RAR6LP Low Profile

(Two fastener strips per package)

Belt Width		Ordering Number			Rivets Required For One Joint
mm	in.	Steel	RustAlloy® 400 Series SS	RustAlloy® Low Profile 400 Series SS	
600	24	R6-SE-24/600			130
750	30	R6-SE-30/750			160
900	36	R6-SE-36/900			200
1050	42	R6-SE-42/1050	RAR6-SE-42/1050	RAR6LP-SE-42/1050	230
1150	46	R6-SE-46/1150	RAR6-SE-46/1150	RAR6LP-SE-46/1150	260
1200	48	R6-SE-48/1200	RAR6-SE-48/1200	RAR6LP-SE-48/1200	270
1350	54	R6-SE-54/1350	RAR6-SE-54/1350	RAR6LP-SE-54/1350	300
1500	60	R6-SE-60/1500	RAR6-SE-60/1500	RAR6LP-SE-60/1500	340
1800	72	R6-SE-72/1800	RAR6-SE-72/1800	RAR6LP-SE-72/1800	410
2130	84	R6-SE-84/2130	RAR6-SE-84/2130	RAR6LP-SE-84/2130	480

Flexco® Scalloped Edge™ RAR8

(Two fastener strips per package)

Belt Width		Ordering Number
mm	in.	RustAlloy® 400 Series SS
1200	48	RAR8-SE-48/1200
1350	54	RAR8-SE-54/1350
1500	60	RAR8-SE-60/1500
1800	72	RAR8-SE-72/1800
2130	84	RAR8-SE-84/2130

Flexco® R5 MegAlloy®

R5 MegAlloy fasteners are supplied as 4 plate strips and are packaged 10 strips per box. Enough fasteners to splice a 900 mm (36") belt.

Ordering Number
R5MA-SE

To maximize fastener service life, see page 3 to select the fastener metal for your application.

Rivet Selection Charts

Rivets

Rivets are available in either steel or stainless steel. Rivets are packaged 250 rivets per box. SRAA, SRA, SRB, and SRC rivets are also available in 100-count packages. Bulk packs of 2,000 rivets are also available in reusable plastic buckets.

Rivet Selection Chart

Fastener Size	Belt Thickness Range		Rivet Size
	mm	in.	
R2	3-6	1/8-7/32	SRAA
	4-8	3/16-5/16	SRA
	7-10	9/32-3/8	SRB
R5	6-8	7/32-5/16	SRA
	7-10	9/32-3/8	SRB
	9-11	11/32-7/16	SRC
	10,5-11	13/32-7/16	SRC/D
R5-1/2 & RAR6LP	8-9	5/16-11/32	SRB
	8-10,5	5/16-13/32	SRC
	10-12	3/8-15/32	SRC/D
	11-13,5	7/16-17/32	SRD
	13-15	1/2-19/32	SRE
	14-16,5	9/16-21/32	SRF*
	16-18	5/8-23/32	SRG*
R6	9-11	11/32-7/16	SRC/D
	10,5-13	13/32-1/2	SRD
	12-14	15/32-9/16	SRE
	13,5-16	17/32-5/8	SRF
	15-17	19/32-11/16	SRG
RAR8	10,5-11	13/32-7/16	SRC/D
	10,5-13	13/32-1/2	SRD
	12-14	15/32-9/16	SRE
	13,5-16	17/32-5/8	SRF
	15-17	19/32-11/16	SRG

** Applies to RAR6LP only.*

Rivets

Self-Setting, Pre-Assembled
With Pilot Nails

Ordering Number	
Steel	Stainless Type 430
Box (100 Rivets)	
SRAA-100	
SRA-100	
SRB-100	
SRC-100	
Box (250 Rivets)	
SRAA	SRAA-S
SRA	SRA-S
SRB	SRB-S
SRC	SRC-S
SRC/D	SRC/D-S
SRD	SRD-S
SRE	SRE-S
SRF	SRF-S
SRG	SRG-S
Bucket (2000 Rivets)	
SRA-2M	SRA-S-2M
SRB-2M	SRB-S-2M
SRC-2M	SRC-S-2M
SRC/D-2M	SRC/D-S-2M
SRD-2M	SRD-S-2M
SRE-2M	SRE-S-2M
SRF-2M	SRF-S-2M
SRG-2M	SRG-S-2M

Flexco® SR™ Scalloped Edge™

Hinge Pin Selection Charts

A wide selection makes it easy to match pins to the needs of the application. Selection ranges from bare steel cable to nylon-covered armored cable. Use the brief descriptions and the chart below to identify which hinge pins are available for each fastener type.

Hinge pin material selection

AC – Bare Armored Cable: *Heavy-duty, long-wearing pin popular in underground mining applications. Armor wrapping protects interior wires.*

ACS – Bare Armored Stainless Steel Cable: *The same advantages as bare armored cable plus corrosion resistance.*

NAC – Nylon Covered Armored Cable: *Combines a durable armored steel wrap with a nylon covering for smooth operation and long service life. Nylon covering prevents pin migration. Not recommended in wet, abrasive applications.*

NC – Nylon Covered Steel Cable: *Nylon covering prevents pin migration. Not recommended in wet, abrasive applications. For R2 and R5 only.*

NCS – Nylon Covered Stainless Steel Cable: *For greater corrosion resistance. Not recommended in wet, abrasive applications. For R2 and R5 only.*

SC – Bare Steel Cable: *Recommended for abrasive or gritty material conveyance.*

SSC – Bare 300 Series Stainless Steel Cable: *For conditions where corrosion attacks steel pins. For R2 and R5 only.*

AC - Bare Armored Cable
ACS - Bare Armored Stainless Cable
NAC - Nylon Covered Armored Cable
NC - Nylon Covered Steel Cable
NCS - Nylon Covered Stainless Cable
SC - Bare Steel Cable
SSC - Bare Stainless Steel Cable

For R2 and R5

Belt Width		Ordering Number									
		AC (6 mm dia.) Bare Armored Cable		ACS (7 mm dia.) Bare Armored Stainless Cable		NAC (6 mm dia.) Nylon Covered Armored Cable		NC (6 mm dia.) Nylon Covered Steel Cable		NCS (6 mm dia.) Nylon Covered Stainless Cable*	
mm	in.	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)
300	12							NC-12-1			
350	14							NC-14-1			
400	16							NC-16-1			
450	18	AC-18-1	AC-18			NAC-18-1	NAC-18	NC-18-1	NC-18		
500	20							NC-20-1			
600	24	AC-24-1	AC-24			NAC-24-1	NAC-24	NC-24-1	NC-24	NCS-24-1	NCS-24
650	26	AC-26-1	AC-26			NAC-26-1	NAC-26		NC-26		
750	30	AC-30-1	AC-30	ACS-30-1	ACS-30	NAC-30-1	NAC-30	NC-30-1	NC-30	NCS-30-1	NCS-30
900	36	AC-36-1	AC-36	ACS-36-1	ACS-36	NAC-36-1	NAC-36	NC-36-1	NC-36	NCS-36-1	NCS-36
1050	42	AC-42-1	AC-42	ACS-42-1	ACS-42	NAC-42-1	NAC-42	NC-42-1	NC-42	NCS-42-1	NCS-42
1200	48	AC-48-1	AC-48	ACS-48-1	ACS-48	NAC-48-1	NAC-48	NC-48-1	NC-48	NCS-48-1	NCS-48
1350	54	AC-54-1		ACS-54-1	ACS-54	NAC-54-1		NC-54-1	NC-54	NCS-54-1	NCS-54
1500	60	AC-60-1		ACS-60-1	ACS-60	NAC-60-1		NC-60-1	NC-60	NCS-60-1	NCS-60
1800	72	AC-72-1		ACS-72-1	ACS-72	NAC-72-1		NC-72-1	NC-72	NCS-72-1	

** 300 Series*

Hinge Pin Selection Charts Continued

For R2 and R5

Belt Width		Ordering Number			
		SC (6 mm dia.) Bare Steel Cable		SSC (6 mm dia.) Bare Stainless Cable*	
mm	in.	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)
450	18		SC-18		SSC-18
600	24	SC-24-1	SC-24	SSC-24-1	SSC-24
750	30	SC-30-1	SC-30	SSC-30-1	SSC-30
900	36	SC-36-1	SC-36	SSC-36-1	SSC-36
950	38				
1000	40				
1050	42	SC-42-1	SC-42	SSC-42-1	SSC-42
1100	44				
1150	46				
1200	48	SC-48-1	SC-48	SSC-48-1	SSC-48
1350	54	SC-54-1	SC-54	SSC-54-1	SSC-54
1500	60	SC-60-1	SC-60	SSC-60-1	SSC-60
1800	72	SC-72-1		SSC-72-1	

** 300 Series*

For R5

Belt Width		Ordering Number			
		SC932 (7 mm dia.) Bare Steel Cable		SSC932 (7 mm dia.) Bare Stainless Cable*	
mm	in.	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)
450	18	SC932-18-1		SSC932-18-1	
600	24	SC932-24-1		SSC932-24-1	
750	30	SC932-30-1	SC932-30	SSC932-30-1	SSC932-30
900	36	SC932-36-1	SC932-36	SSC932-36-1	SSC932-36
950	38	SC932-38-1	SC932-38	SSC932-38-1	SSC932-38
1000	40	SC932-40-1	SC932-40	SSC932-40-1	SSC932-40
1050	42	SC932-42-1	SC932-42	SSC932-42-1	SSC932-42
1100	44	SC932-44-1	SC932-44	SSC932-44-1	SSC932-44
1150	46	SC932-46-1	SC932-46	SSC932-46-1	SSC932-46
1200	48	SC932-48-1	SC932-48	SSC932-48-1	SSC932-48
1350	54	SC932-54-1	SC932-54	SSC932-54-1	SSC932-54
1500	60	SC932-60-1	SC932-60	SSC932-60-1	SSC932-60
1800	72	SC932-72-1		SSC932-72-1	

** 300 Series*

For R5-1/2, R6, RAR6LP

Belt Width		Ordering Number			
		AC6 (10 mm dia.) Bare Armored Steel Cable		SC6 (9 mm dia.) Bare Steel Cable	
mm	in.	Each (One Pin)	Package (Ten Pins)	Each (One Pin)	Package (Ten Pins)
600	24	AC6-24-1	AC6-24		
750	30	AC6-30-1	AC6-30		
900	36	AC6-36-1	AC6-36		SC6-36
950	38	AC6-38-1	AC6-38	SC6-38-1	SC6-38
1000	40	AC6-40-1	AC6-40	SC6-40-1	SC6-40
1050	42	AC6-42-1	AC6-42	SC6-42-1	SC6-42
1100	44	AC6-44-1	AC6-44	SC6-44-1	SC6-44
1150	46			SC6-46-1	SC6-46
1200	48	AC6-48-1	AC6-48	SC6-48-1	SC6-48
1300	52				
1350	54	AC6-54-1	AC6-54	SC6-54-1	SC6-54
1500	60	AC6-60-1	AC6-60	SC6-60-1	SC6-60
1800	72	AC6-72-1	AC6-72	SC6-72-1	SC6-72
2130	84		AC6-84	SC6-84-1	SC6-84

For R5-1/2, R6, RAR6LP, RAR8

Ordering Number	
ACS6 (10 mm dia.) Bare Armored Stainless Cable*	
Each (One Pin)	Package (Ten Pins)
ACS6-36/900-1	ACS6-36/900
ACS6-40-1	ACS6-40
ACS6-42-1	ACS6-42
ACS6-46-1	ACS6-46
ACS6-48-1	ACS6-48
ACS6-52-1	ACS6-52
ACS6-54-1	ACS6-54
ACS6-60-1	ACS6-60
ACS6-72-1	ACS6-72
ACS6-84-1	ACS6-84

** 300 Series*

For R6, RAR6LP

Ordering Number	
NAC6 (10 mm dia.) Nylon Covered Armored Cable	
Each (One Pin)	Package (Ten Pins)
NAC6-24-1	NAC6-24
NAC6-30-1	NAC6-30
NAC6-36-1	NAC6-36
NAC6-38-1	NAC6-38
NAC6-40-1	NAC6-40
NAC6-42-1	NAC6-42
NAC6-44-1	NAC6-44
NAC6-46-1	NAC6-46
NAC6-48-1	NAC6-48
NAC6-52-1	NAC6-52
NAC6-54-1	NAC6-54
NAC6-60-1	NAC6-60
NAC6-72-1	NAC6-72
NAC6-84-1	NAC6-84

Flexco® SR™ Scalloped Edge™ Installation Tools

MSRT & MSRT8 Multiple Rivet Driving Tools

Simplifies multiple rivet driving by holding belt, fastener strip, and SR700 guide blocks (included) securely in place. Drives five rivets simultaneously and installs four fastener plates before reloading. Includes two SR700 guide blocks, two SR759 drive rods, canvas bag, lubricant and two 1,8 kgs. (4 lb.) hammers.

MSRT8 Applicator Complete

(Installs R6, RAR6 & RAR8 fasteners only)

Belt Width		Ordering Number
mm	in.	
1200	48	MSRT8-48
1500	60	MSRT8-60
1800	72	MSRT8-72
2130	84	MSRT8-84

MSRT Applicator Complete

(Installs R5, R5-1/2, R6, & RAR6 fasteners only)

Belt Width		Ordering Number
mm	in.	
750	30	MSRT-30
900	36	MSRT-36
1050	42	MSRT-42
1200	48	MSRT-48
1500	60	MSRT-60
1800	72	MSRT-72
2130	84	MSRT-84

MSRT in use

SRTA Single Rivet Driving Tool

Used for single rivet driving, the SRTA tool holds and positions the rivet to ensure safer rivet driving. Includes anvil plate surface and SR-50 driver. Order the SRTA according to belt width.

Belt Width		Ordering Number
mm	in.	
750	30	SRTA-30
900	36	SRTA-36
1050	42	SRTA-42
1200	48	SRTA-48
1500	60	SRTA-60
1800	72	SRTA-72
2130	84	SRTA-84

R2T Tool

Lightweight and portable, the R2T installs up to 300 mm (12") of R2 fasteners in one pass. Use with standard SR™ self-setting rivets and 0,9 kgs. (2 lb.) hammer. (MSRT or SRTA tools can also be used for R2 installation by using the R5 setting.)

Tool Size		Ordering Number
mm	in.	
300	12	R2T

Power Driver

Fast and easy installation of Flexco® rivet fasteners. Requires 4,1-5,8 bars (60-85 psig) air source with a recommended setting of 5,1 bars (75 psig) that delivers a minimum of 8 SCFM. Air source must be connected by no more than 6 m (20') of hose and fittings.

Ordering Number
FPD1

Belt Maintenance Products

Far-Pul® HD® Belt Clamps

Easy-to-use, lightweight belt clamp, specially engineered for heavy-duty applications. Load capacity to 2,7 metric tons (3 imperial tons) when used with two 1-1/2 ton come-alongs. Securely grips belts up to 25 mm (1") thick, and scissors slide easily into place to adjust to a variety of belt widths. Provides even tensioning across entire belt width. Extruded aluminum construction resists corrosion and seizing in wet environments.

Belt Width		Ordering Number
mm	in.	
Up to 750	Up to 30"	LSHD30
Up to 900	Up to 36"	LSHD36
Up to 1050	Up to 42"	LSHD42
Up to 1200	Up to 48"	LSHD48
Up to 1350	Up to 54"	LSHD54
Up to 1500	Up to 60"	LSHD60
Up to 1800	Up to 72"	LSHD72

Complete set includes four clamp bars, and four clamp scissors with carry bag. Come-alongs not included.

840 Series Belt Cutter

Lightweight, easy-to-use cutter for belts up to 2100 mm (84") wide. Grips belts securely and features shielded, chain-driven, double-edged safety blade for rubber or PVC belting up to 25 mm (1") thick.

Belt Widths Up To:		Ordering Number
mm	in.	
900	36	840836
1200	48	840848
1500	60	840860
1800	72	840872
2100	84	840884

Alligator® 300 Series Belt Cutter

For belts of any width up to 28 mm (1-1/8") thick, the Alligator® 300 Series belt cutter delivers clean, straight cuts quickly and safely. The double-edged blade cuts in either direction. An extra-long blade can also be special ordered for belts up to 39 mm (1-9/16") thick.

Belt Width		Ordering Number
mm	in.	
300	12	300312
450	18	300318
600	24	300324
750	30	300330
900	36	300336
1050	42	300342
1200	48	300348
1500	60	300360

Belt Maintenance Products

Flexco® Belt Grips

Pulls belts up to 16 mm (5/8") thick without damaging belt surface. Sold in pairs.

Ordering Number
22

FSK™ Belt Skiver

Portable, lightweight skiver adjusts easily to various cutting depths. Use on rubber-covered belts with top covers of 4,5 mm (3/16") or more. Depths from 1,5 mm (1/16") to 10 mm (3/8") in a single pass – deeper with multiple passes. Cutting depth gauged from bottom of belt surface for use on most worn belt surfaces.

Ordering Number
FSK-1

Flexco® Belt Groover

For "nesting" splice leading edges at or below the belt surface to reduce splice profile. Can also be used to cut a series of grooves to countersink entire splice.

Ordering Number
FBG16

Card Cutter

Heavy-duty utility knife with easy-grip handle.

Ordering Number
GC-1

Flexco® Silicone Lubricant

Reduces friction on metal tools and rubber or fabric belt surfaces to simplify cutting or punching. Non-flammable. Does not contain fluorocarbons.

Ordering Number
SL5-1

Persuader™ Conveyor Belt Positioner™

The Persuader™ Conveyor Belt Positioner™ is a dependable, field-proven solution for the lost production time and repair costs associated with off-center loading and belt mistracking.

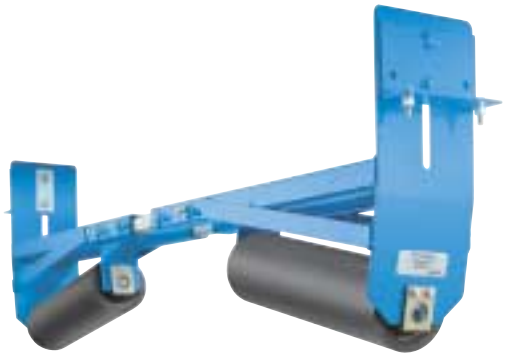
The simple, easy-to-install solution for belt mistracking

The Persuader features an innovative design: rollers make smooth contact with the return belt's bottom cover, centering it into the correct path and holding it there. This centering action at the critical loading point solves many top-side tracking problems. In fact, most top-side tracking problems can be solved with a single Persuader at the tail pulley.

Persuader™

Heavy-Duty XL Persuader™ for wider, higher-tension belts

For thicker, higher-tension steel-cable belts, and belts between 1800 mm (72") and 2400 mm (96") wide, choose the Heavy-Duty XL Persuader™ It combines the design and performance advantages of the Persuader, with CEMA E rollers and bearings.



Heavy-Duty XL Persuader™

Persuader™ Conveyor Belt Positioner™*

Description	Belt Width (Min–Max)		Persuader Width (Min–Max)		Ordering Number
	mm	in.	mm	in.	
Small	450-600	18-24	600-850	24-34	CBP-S
Medium	750-1200	30-48	850-1400	34-56	CBP-M
Large	1350-1800	54-72	1400-2075	56-83	CBP-L
Extra Large	1800-2400	72-96	1800-3000	72-120	CBP-X

**Persuader comes standard with Exalon rollers.*

Use next larger size for belt widths between ranges.

NOTE: Idler Rollers on Sizes S, M and L are 125 mm (5") diameter and rated CEMA D. Idler Rollers on the XL Size are 150 mm (6") diameter and rated CEMA E.

Persuader™ Conveyor Belt Positioner™ With Steel Rollers

Description	Belt Width (Min–Max)		Persuader Width (Min–Max)		Ordering Number
	mm	in.	mm	in.	
Small	450-600	18-24	600-850	24-34	PSR-S
Medium	750-1200	30-48	850-1400	34-56	PSR-M
Large	1350-1800	54-72	1400-2075	56-83	PSR-L
Extra Large	1800-2400	72-96	1800-3000	72-120	PSR-X

Use next larger size for belt widths between ranges.

NOTE: Idler Rollers on Sizes S, M and L are 125 mm (5") diameter and rated CEMA D. Idler Rollers on the XL Size are 150 mm (6") diameter and rated CEMA E.

Deflector™ Belt Plows

Specially designed belt cleaners for the tail pulley, Deflector™ Belt Plows feature an exclusive, innovative blade design. The blade's 20° leading edge "spirals" debris off the inside of the belt. Compare this to ordinary flat-blade plows and homemade devices that often just let debris roll under the blade.

Deflector™ V-Plow

- Self-adjusting unit eliminates the need to readjust to accommodate blade wear.
- Turnbuckle permits precise adjustment so the plow can be fine-tuned to the belt at installation and eliminate unit vibration.
- Can also be positioned directly behind the head pulley to dump debris right at the transfer point.

Description	Belt Width (Min–Max)		Ordering Number
	mm	in.	
Extra Small	450-600	18-24	CBV-XS
Small	750-900	30-36	CBV-S
Medium	1050-1200	42-48	CBV-M
Large	1350-1500	54-60	CBV-L
1800 mm	1800	72	CBV-72
2100 mm	2100	84	CBV-84
2400 mm	2400	96	CBV-96

Use next larger size for belt widths between ranges.

Deflector™ Diagonal Plow

- Installed on a 45° angle across the belt to discharge debris to one side of the belt.
- Blade is installed in a fixed position, eliminating bouncing problems associated with some floating-style plows.

Description	Belt Width (Min–Max)		Ordering Number
	mm	in.	
Small	450-750	18-30	CBD-S
Medium	900-1050	36-42	CBD-M
Large	1200-1500	48-60	CBD-L
X-Large	1800-2100	72-84	CBD-XL

Use next larger size for belt widths between ranges.

Deflector™ Heavy-Duty Reversing Diagonal Plow

- Twin-bladed plow designed to clean belt in both directions of travel.
- Discharges material to either side of the belt.
- Installs securely to conveyor structure and will work on conveyors with severe belt vibration.

Description	Belt Width (Min–Max)		Ordering Number
	mm	in.	
Small	450-750	18-30	CBR-S
Medium	900-1050	36-42	CBR-M
Large	1200-1500	48-60	CBR-L
1800 mm	1800	72	CBR-72
2100 mm	2100	84	CBR-84
2400 mm	2400	96	CBR-96

Use next larger size for belt widths between ranges.

Flex-Lok™ Conveyor Skirt Clamps

Our versatile skirt clamp design makes it easy to eliminate loading-point spillage on any conveyor loading site – even in severe heavy-loading applications.

Flex-Lok™ is ideal on perpendicular or vertical skirt boards. The unique design ensures that, once properly installed, the skirt rubber will not rub on the belt causing premature wear or gouge marks on the belts.

Easy installation and quick adjustment

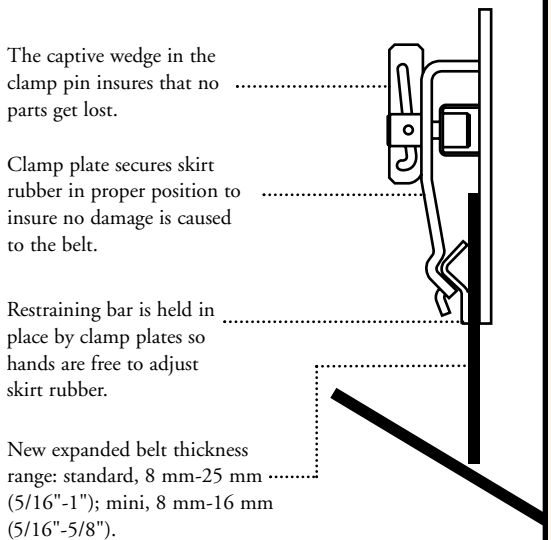
Flex-Lok utilizes a unique clamp pin and wedge lock assembly, so the assembly can be locked in any position 360° around the pin. The remaining parts interlock, too, allowing one person to reposition or replace skirt rubber. The clamp plates and pins can be placed in various positions along the clamp runners – even in the most restrictive environments.

Flex-Lok™ Skirt Clamp

(One 1,8 meter skirt clamp includes one 1,8 m (6') clamp runner, 4 clamp plates, 4 clamp pins and one 1,8 m (6') restraining bar.)

Description	Ordering Number
Skirt Clamp Complete	FLSC-I

Flex-Lok comes in standard 1,8 m (6') lengths, and can be easily modified for shorter length requirements.


The captive wedge in the clamp pin insures that no parts get lost.
Clamp plate secures skirt rubber in proper position to insure no damage is caused to the belt.
Restraining bar is held in place by clamp plates so hands are free to adjust skirt rubber.
New expanded belt thickness range: standard, 8 mm-25 mm (5/16"-1"); mini, 8 mm-16 mm (5/16"-5/8").

Mini Flex-Lok™ for confined space applications

With an overall height of just 135 mm (5-1/2"), the Mini Flex-Lok is the ideal remedy for loading-point spillage in restricted space applications.

Mini Flex-Lok™ Skirt Clamp

(One 1,8 meter mini skirt clamp includes one 1,8 m (6') clamp runner, 3 mini clamp plates, 3 clamp pins and one 1,8 m (6') restraining bar.)

Description	Ordering Number
Mini Skirt Clamp Complete	FLSCM-I

From coal mines to grocery stores, companies that rely on conveyors also rely on Flexco for belt conveyor maintenance solutions that help maximize uptime, productivity, and safety. We offer the most comprehensive selection of quality products in the industry. And we back customers with product and application support second to no one.

To request a catalog, use the order form found on our Web site at ***www.flexco.com****. Or contact us at* ***+1-630-971-0150****, or via fax at* ***+1-630-971-1180****.*

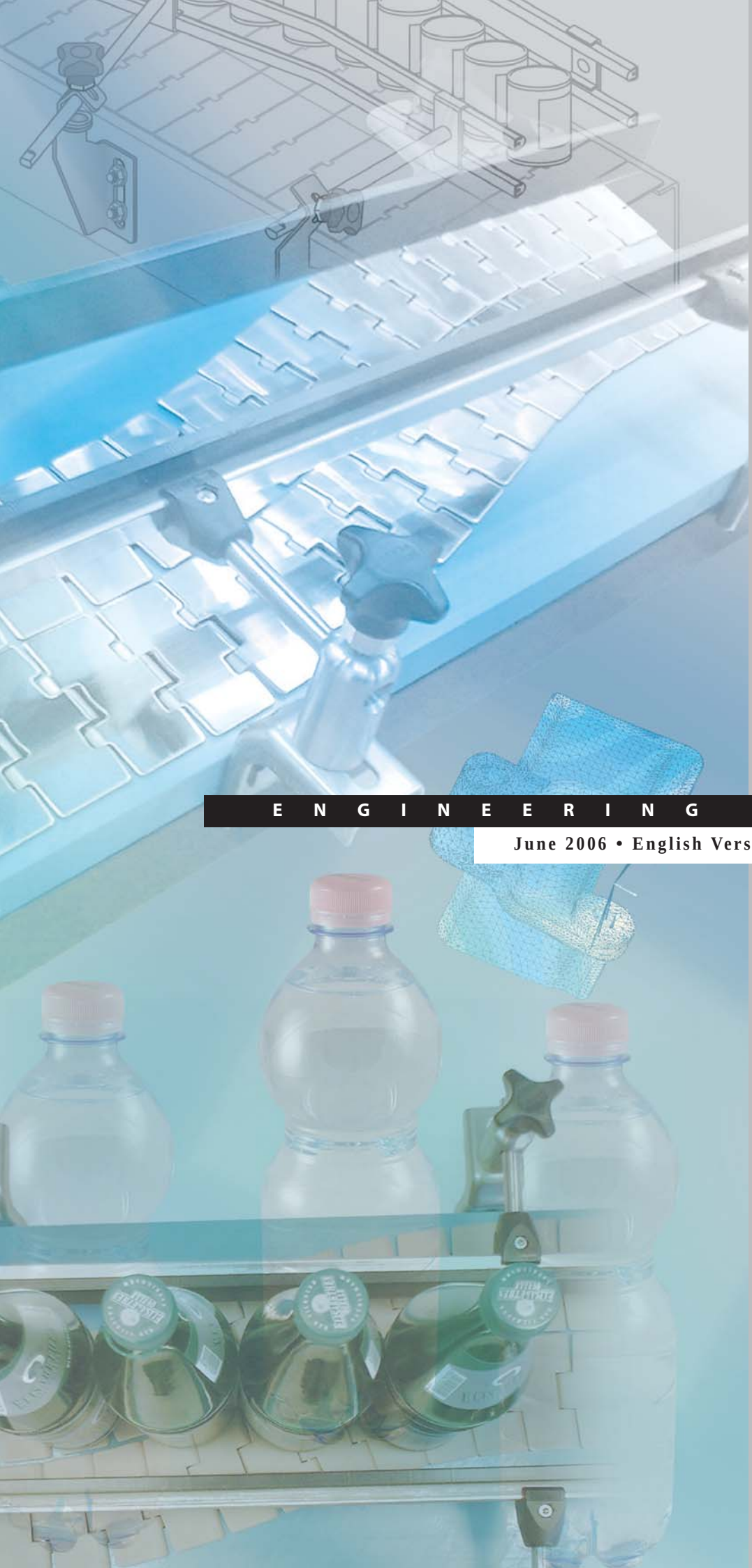
FLEXIBLE STEEL LACING COMPANY ISO 9000 REGISTERED

Flexible Steel Lacing Company
2525 Wisconsin Avenue
Downers Grove, IL 60515-4200 U.S.A.
Telephone: +1-630-971-0150
Fax: +1-630-971-1180
E-mail: advertising@flexco.com
Visit our Web site at: www.flexco.com

Australia: 61-2-9680-3322 • England: 44-1457-891000 • Germany: 49-7428-9406-0 • Mexico: 52 55 56-74-53-26
New Zealand: 64-9-415-4488 • Republic of South Africa: 27-11-974-2771

© 2002 Flexible Steel Lacing Company, 5/02-10, Part#X0795
Alligator®, Far-Pul®, Flexco®, Flexco-Lok®, HD®, MegAlloy®, RustAlloy®, and Wedlok®are registered trademarks, and Deflector™, Flex-Lok™, FSK™, Persuader™, Positioner™, Quick-Fit™, Scalloped Edge™, and SR™ are trademarks of Flexible Steel Lacing Company.

FLEXCO



Solus
A System Plast Group Company

FLEXON SYSTEM PLAST

ENGINEERING MANUAL

June 2006 • English Version • Issue 1.0

SYSTEM PLAST CONVEYOR COMPONENTS

ENGINEERING MANUAL

Solus
A System Plast Group Company

FLEXON
SYSTEM PLAST

SYSTEM PLAST
CONVEYOR COMPONENTS

CONTENTS

INTRODUCTION 4

SELECTION GUIDE 5
General selection guidelines 5
Application related selection guide 6
- Plastic chain materials 9
- Steel chain materials 9
- Nolu-Clean 10
- Nolu-S 11
- Material instruction leaflets 12

CONSTRUCTION DETAILS 14
- Drive construction 14
- Wrap around angle α 14
- Catenary sag 14
- Tensioner 15
- Roller dimensions 15
- Wear Strips 16
Construction 16
Selection of wear strip material 18
- Return part construction 19
- Sprockets and idler wheels 20
- Sprocket position 20
- Wearstrip position 20
- Shafts 21
- Shaft tolerances for chain sprockets 21
- Shaft tolerances for belts sprockets 21
- Sprocket position for belt 22
- Belt with positioner 25
- Location of positioner 25
- Belt assembly instructions 26
- Transfer 27
Assembly 28
- Belt with transfer wing 31
- Side guides for belt 31
- Dual magnetic corner tracks 32
- Assembly instructions 34
- Extra dual magnetic corner track 35
- Self cleaning (SC) dual magnetic corner track 36
- Comparison of corner track holding systems 36
- Installation 37
- Corner track 38
for TAB chains 38
for bevel chains 38
for chains with roller chains 39
for LBP chains and 39
for multiflex chains and 39
for CC chians 39
- Installation 39
- Straight tracks 39

APPLICATIONS 40
- Inclined and declined conveyors 40
- Drive construction 40
- Curve construction in combination with inclines/declines 41
- Accumulation of products 41
- Pressureless combiner 42
  Suitable chains/belts 42
- Optimised steel chains 43
- HB pins for extended wear life 44
  Life time expectancy 45
- Create conveying 47
- Gripper chain applications 48

PRODUCT HANDLING 51
- Conveyor length 51
- Conveyor speed 51
- STM safe tranfer module 52
- Static electricity 54
- Product stability 55
- Noise reduction 55
- Product guides 56
- SpeedSet 58
- Side guides for crates 60

CALCULATION 61
- Required data for chain calculation 61
- Required data for belt calculation 62
- Conveyor calculation 63
- Coefficient of friction 66
- Parameters causing wear 67
- Forces on the chain 68
- Forces in the curve 69
- PV 69
- Experimental results of wear tests - NG against acetal 70

MAINTENANCE 71
- Lubrication 71
- Cleaning 72
- Cleaning plastic chains 73
- Cleaning instructions 74
- Cleaning process 75
- Critical sections of a conveyor line which need special attention regarding cleanness 77
- Inspection procedure 78
- Installation procedure 79
- Trouble shooting 80
- Replacement criteria 82
- Chemical resistence 83
- Application temperatures 86
- Expansion factors 86
- Conversion factors (SI) 86

INTRODUCTION

This Engineering Manual has been developed to assist you with specific engineering information when a new conveyor is designed as well as when a conveyor is going to be modified.

All guidelines in this Engineering Manual are given to our best knowledge and are believed to be reliable, based on experience. In case, that you are not sure, if the information given applies to your situation or when you need more information about a specific subject, please contact us.

We cannot take responsibility for imperfections, damage or injuries due to wrong conveyor design, poor installation or improper use of our products made with or without reference to the information in this manual.

We appreciate your suggestions to improve this Engineering Manual.

For additional data and information about technical details of our products please refer to:

- Conveyor Chains & Belts catalogues
- Conveyor Components catalogues
- Calculation programme
- or contact our Technical Support
  +49 (0)6204 9673 242

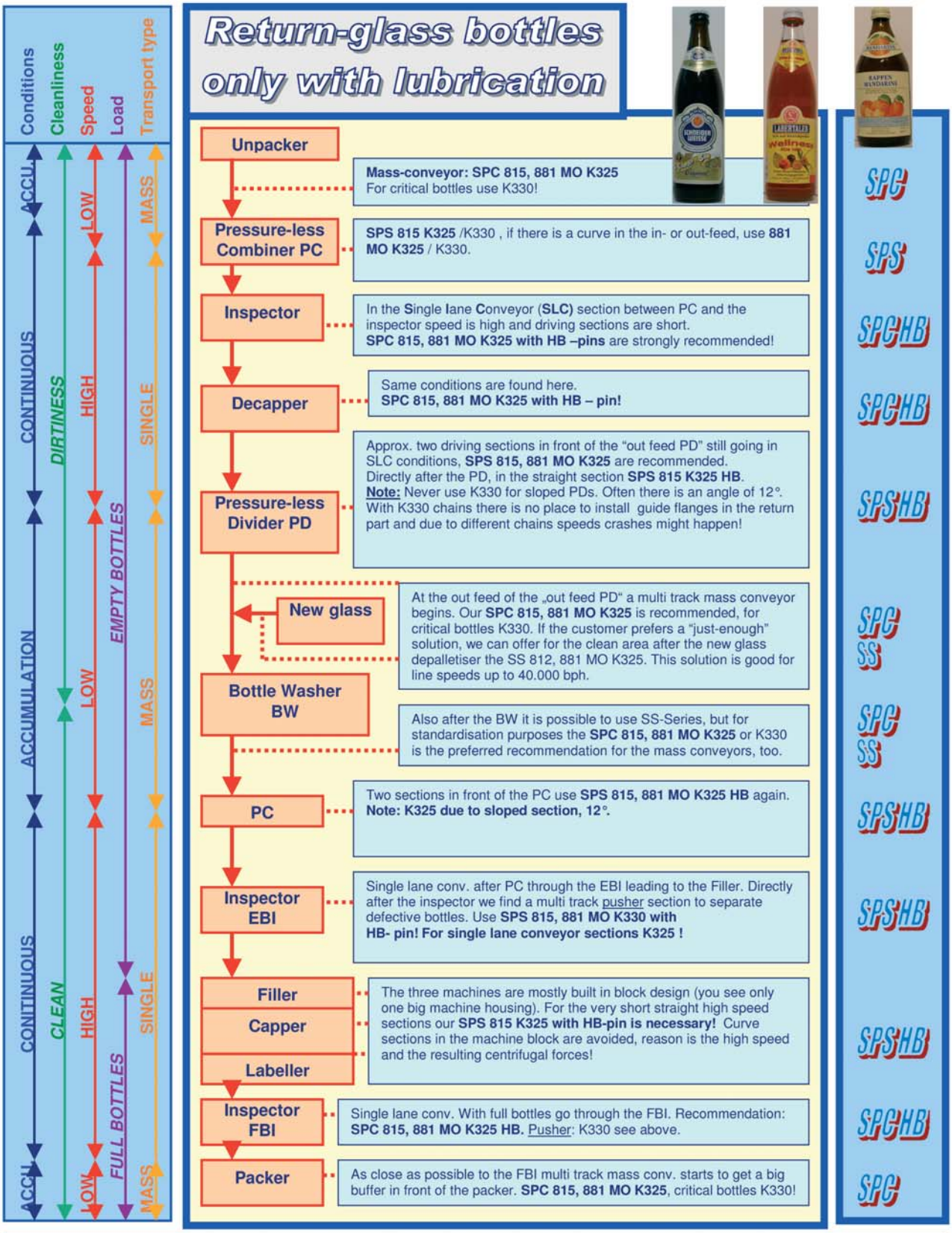
SELECTION GUIDE

General selection guidelines

*preferred

Product	Application	Options	Comments
Cans	General conveying	Flush Grid belt* Plastic chain	Best product handling Lubrication recommend
One-way glass	General conveying	Flat Top belt Steel chain*	Lubrication recommend Lubrication required
Return glass	General conveying	Steel chain* Flat Top Heavy Duty belt	Lubrication required Lubrication recommend
One-way PET	General conveying	Flat Top belt Plastic chain Steel chain	Lubrication required Lubrication required
Return PET	General conveying	Belt Steel chain	Lubrication recommend Lubrication required
Crates	Horizontal	CC chains Steel chains*	If dry operation is required
	Inclines & declines	High friction steel chains	
	Accumulation	CC chains Steel chains	If dry operation is required
Boxes	Horizontal	Belt Plastic chain	Best product handling General conditions
	Inclines & declines	High friction plastic chains/belts	General conditions
	Accumulation	LBP chains/belts	General conditions
Shrink-wrapped products	Horizontal	Belt	Best product handling
	Inclines & declines	High friction plastic chains/belts	General conditions
	Accumulation	LBP chains/belts	General conditions

Application related selection guide

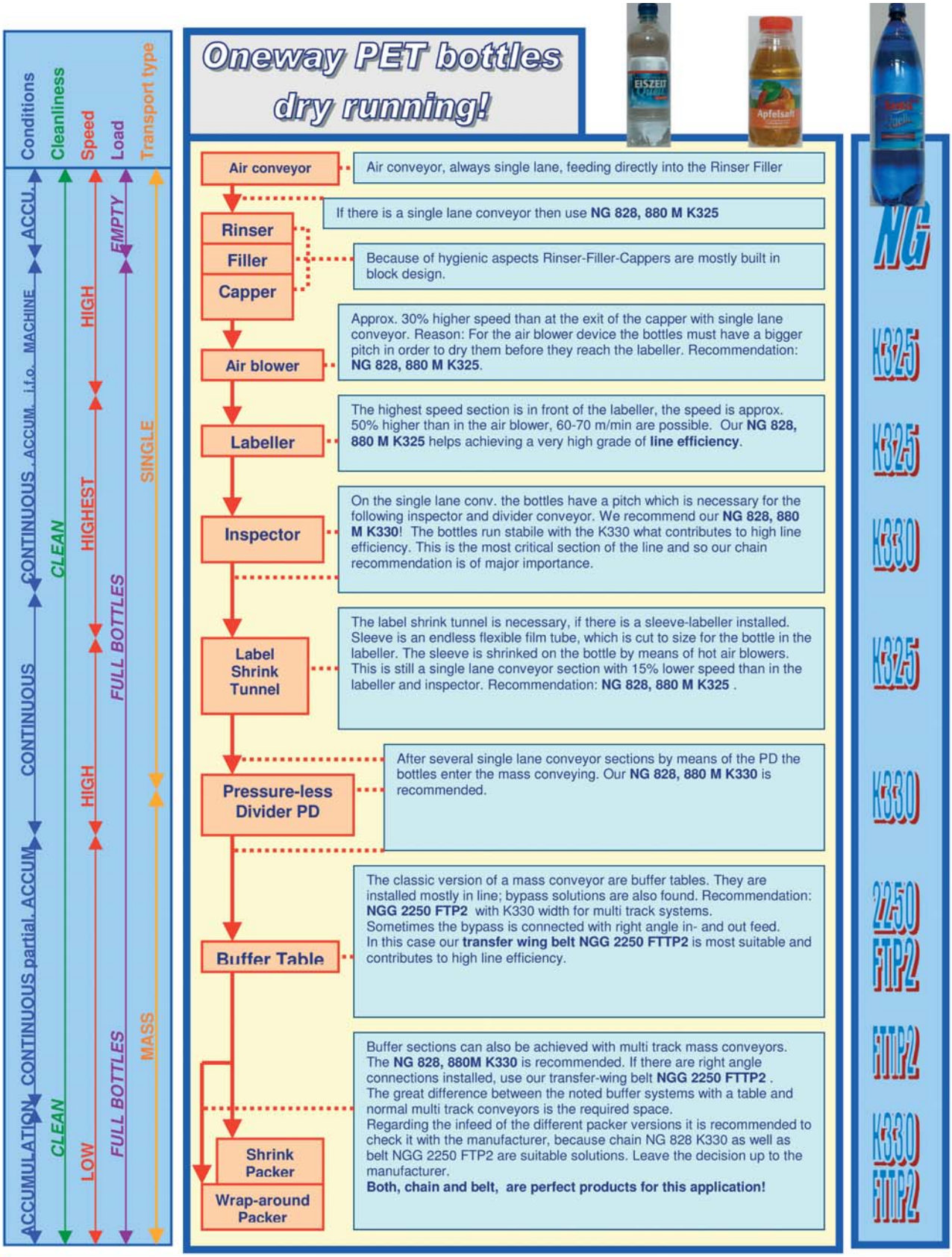

Conditions
Cleanliness
Speed
Load
Transport type
ACCU.
CONTINUOUS
DIRTINESS
HIGH
LOW
MASS
SINGLE
EMPTY BOTTLES
ACCUMULATION
CLEAN
FULL BOTTLES
Return-glass bottles only with lubrication
Unpacker
Mass-conveyor: SPC 815, 881 MO K325
For critical bottles use K330!
Pressure-less Combiner PC
SPS 815 K325 /K330 , if there is a curve in the in- or out-feed, use 881 MO K325 / K330.
Inspector
In the Single lane Conveyor (SLC) section between PC and the inspector speed is high and driving sections are short.
SPC 815, 881 MO K325 with HB –pins are strongly recommended!
Decapper
Same conditions are found here.
SPC 815, 881 MO K325 with HB – pin!
Pressure-less Divider PD
Approx. two driving sections in front of the "out feed PD" still going in SLC conditions, SPS 815, 881 MO K325 are recommended.
Directly after the PD, in the straight section SPS 815 K325 HB.
Note: Never use K330 for sloped PDs. Often there is an angle of 12°.
With K330 chains there is no place to install guide flanges in the return part and due to different chains speeds crashes might happen!
New glass
At the out feed of the „out feed PD" a multi track mass conveyor begins. Our SPC 815, 881 MO K325 is recommended, for critical bottles K330. If the customer prefers a "just-enough" solution, we can offer for the clean area after the new glass depalletiser the SS 812, 881 MO K325. This solution is good for line speeds up to 40.000 bph.
Bottle Washer BW
Also after the BW it is possible to use SS-Series, but for standardisation purposes the SPC 815, 881 MO K325 or K330 is the preferred recommendation for the mass conveyors, too.
PC
Two sections in front of the PC use SPS 815, 881 MO K325 HB again.
Note: K325 due to sloped section, 12°.
Inspector EBI
Single lane conv. after PC through the EBI leading to the Filler. Directly after the inspector we find a multi track pusher section to separate defective bottles. Use SPS 815, 881 MO K330 with HB- pin! For single lane conveyor sections K325 !
Filler
Capper
Labeller
The three machines are mostly built in block design (you see only one big machine housing). For the very short straight high speed sections our SPS 815 K325 with HB-pin is necessary! Curve sections in the machine block are avoided, reason is the high speed and the resulting centrifugal forces!
Inspector FBI
Single lane conv. With full bottles go through the FBI. Recommendation: SPC 815, 881 MO K325 HB. Pusher: K330 see above.
Packer
As close as possible to the FBI multi track mass conv. starts to get a big buffer in front of the packer. SPC 815, 881 MO K325, critical bottles K330!
SPC
SPS
SPC HB
SPC HB
SPS HB
SPC SS
SPC SS
SPS HB
SPS HB
SPS HB
SPC HB
SPC

Note: Two aspects should be considered: 1) standardisation/reduction of parts variety, which is a well accepted aspect for big filling companies and 2) "just-enough" solutions, which lead to adequate chains for each application. Depending on the it is important to chose the right way to attract customers interest.

Flexon System Plast GmbH
Alfred-Nobel-Str. 4
68519 Viernheim, Germany

Technical Support
☎ +49(6204)9673-242

Application related selection guide

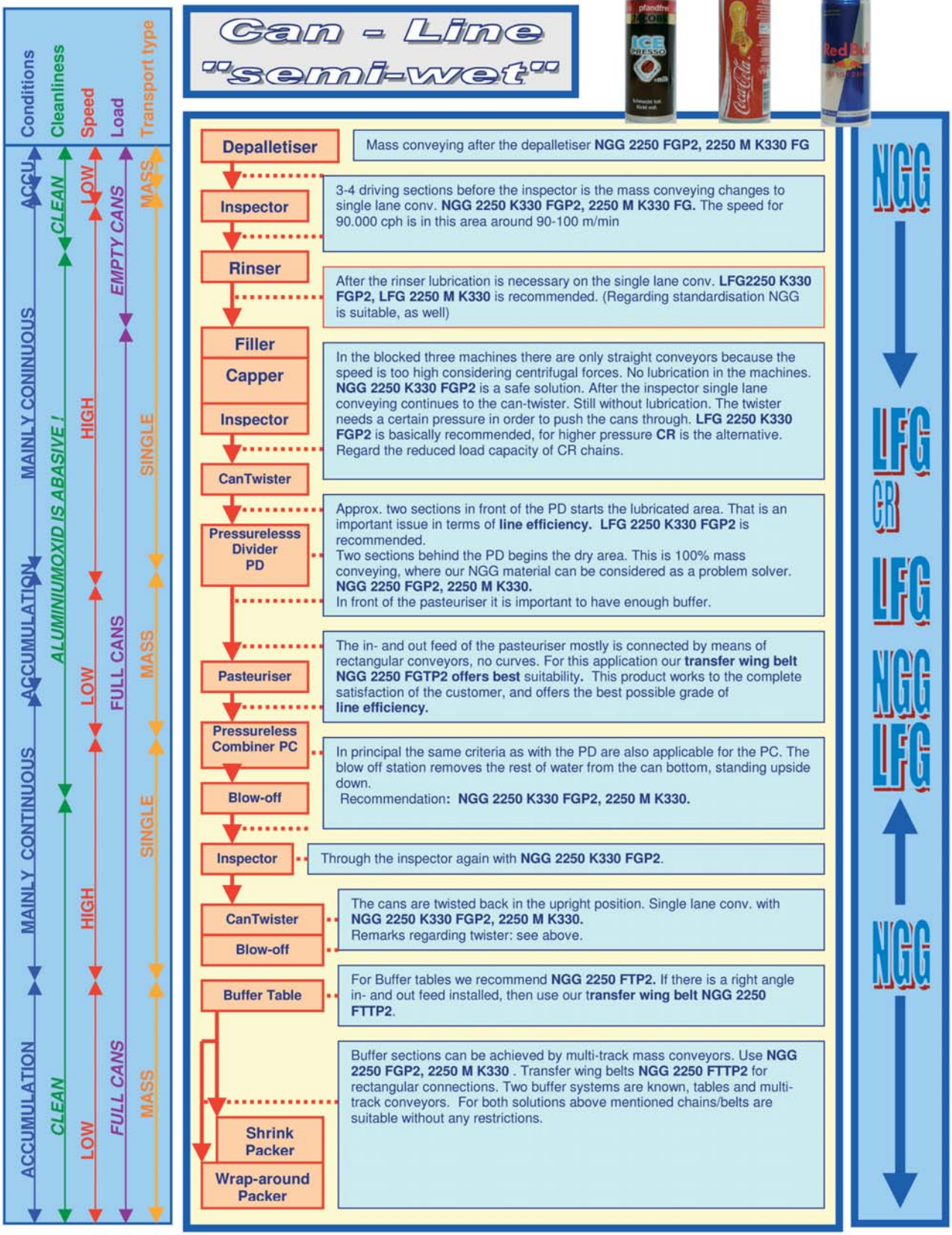

Conditions
Cleanliness
Speed
Load
Transport type
ACCUMULATION
CONTINUOUS partial ACCUM.
CONTINUOUS
CONTINUOUS ACCUM. i.f.o. MACHINE
ACCU.
CLEAN
LOW
HIGH
HIGHEST
EMPTY
FULL BOTTLES
MASS
SINGLE
Oneway PET bottles dry running!
Air conveyor
Air conveyor, always single lane, feeding directly into the Rinser Filler
If there is a single lane conveyor then use NG 828, 880 M K325
Rinser
Filler
Capper
Because of hygienic aspects Rinser-Filler-Cappers are mostly built in block design.
Air blower
Approx. 30% higher speed than at the exit of the capper with single lane conveyor. Reason: For the air blower device the bottles must have a bigger pitch in order to dry them before they reach the labeller. Recommendation: NG 828, 880 M K325.
Labeller
The highest speed section is in front of the labeller, the speed is approx. 50% higher than in the air blower, 60-70 m/min are possible. Our NG 828, 880 M K325 helps achieving a very high grade of line efficiency.
Inspector
On the single lane conv. the bottles have a pitch which is necessary for the following inspector and divider conveyor. We recommend our NG 828, 880 M K330! The bottles run stabile with the K330 what contributes to high line efficiency. This is the most critical section of the line and so our chain recommendation is of major importance.
Label Shrink Tunnel
The label shrink tunnel is necessary, if there is a sleeve-labeller installed. Sleeve is an endless flexible film tube, which is cut to size for the bottle in the labeller. The sleeve is shrinked on the bottle by means of hot air blowers. This is still a single lane conveyor section with 15% lower speed than in the labeller and inspector. Recommendation: NG 828, 880 M K325 .
Pressure-less Divider PD
After several single lane conveyor sections by means of the PD the bottles enter the mass conveying. Our NG 828, 880 M K330 is recommended.
Buffer Table
The classic version of a mass conveyor are buffer tables. They are installed mostly in line; bypass solutions are also found. Recommendation: NGG 2250 FTP2 with K330 width for multi track systems.
Sometimes the bypass is connected with right angle in- and out feed.
In this case our transfer wing belt NGG 2250 FTTP2 is most suitable and contributes to high line efficiency.
Buffer sections can also be achieved with multi track mass conveyors. The NG 828, 880M K330 is recommended. If there are right angle connections installed, use our transfer-wing belt NGG 2250 FTTP2 .
The great difference between the noted buffer systems with a table and normal multi track conveyors is the required space.
Regarding the infeed of the different packer versions it is recommended to check it with the manufacturer, because chain NG 828 K330 as well as belt NGG 2250 FTP2 are suitable solutions. Leave the decision up to the manufacturer.
Both, chain and belt, are perfect products for this application!
Shrink Packer
Wrap-around Packer
NG
K325
K325
K330
K325
K330
2250 FTP2
FTP2
K330 FTP2

Note: For critical curve sections for single lane conv. our EXTRA version for magnetic as well as for TAB series are recommended. EXTRA curves are a problem solver for mass conv., too. Nolu-S can be used as well. Wear strips for high speed dry running chains or belts in a hardened and smooth stainless steel version provide excellent performance. Return rollers in the "formula one" version contribute to low noise and lower wear. Using K330 throughout the entire line is a good aspect in terms of standardization!

Flexon System Plast GmbH
Alfred-Nobel-Str. 4
68519 Viernheim, Germany

Technical Support
☎ +49(6204)9673-242

Application related selection guide


Can - Line
"semi-wet"
Conditions
Cleanliness
Speed
Load
Transport type
ACCU
MAINLY CONINUOUS
ACCUMULATION
MAINLY CONTINUOUS
ACCUMULATION
CLEAN
ALUMINIUMOXID IS ABASIVE !
CLEAN
LOW
HIGH
LOW
HIGH
LOW
EMPTY CANS
FULL CANS
FULL CANS
MASS
SINGLE
MASS
SINGLE
MASS
Depalletiser
Mass conveying after the depalletiser NGG 2250 FGP2, 2250 M K330 FG
Inspector
3-4 driving sections before the inspector is the mass conveying changes to single lane conv. NGG 2250 K330 FGP2, 2250 M K330 FG. The speed for 90.000 cph is in this area around 90-100 m/min
Rinser
After the rinser lubrication is necessary on the single lane conv. LFG2250 K330 FGP2, LFG 2250 M K330 is recommended. (Regarding standardisation NGG is suitable, as well)
Filler
Capper
Inspector
In the blocked three machines there are only straight conveyors because the speed is too high considering centrifugal forces. No lubrication in the machines. NGG 2250 K330 FGP2 is a safe solution. After the inspector single lane conveying continues to the can-twister. Still without lubrication. The twister needs a certain pressure in order to push the cans through. LFG 2250 K330 FGP2 is basically recommended, for higher pressure CR is the alternative. Regard the reduced load capacity of CR chains.
CanTwister
Pressurelesss Divider PD
Approx. two sections in front of the PD starts the lubricated area. That is an important issue in terms of line efficiency. LFG 2250 K330 FGP2 is recommended.
Two sections behind the PD begins the dry area. This is 100% mass conveying, where our NGG material can be considered as a problem solver. NGG 2250 FGP2, 2250 M K330.
In front of the pasteuriser it is important to have enough buffer.
Pasteuriser
The in- and out feed of the pasteuriser mostly is connected by means of rectangular conveyors, no curves. For this application our transfer wing belt NGG 2250 FGTP2 offers best suitability. This product works to the complete satisfaction of the customer, and offers the best possible grade of line efficiency.
Pressureless Combiner PC
Blow-off
In principal the same criteria as with the PD are also applicable for the PC. The blow off station removes the rest of water from the can bottom, standing upside down.
Recommendation: NGG 2250 K330 FGP2, 2250 M K330.
Inspector
Through the inspector again with NGG 2250 K330 FGP2.
CanTwister
Blow-off
The cans are twisted back in the upright position. Single lane conv. with NGG 2250 K330 FGP2, 2250 M K330.
Remarks regarding twister: see above.
Buffer Table
For Buffer tables we recommend NGG 2250 FTP2. If there is a right angle in- and out feed installed, then use our transfer wing belt NGG 2250 FTTP2.
Buffer sections can be achieved by multi-track mass conveyors. Use NGG 2250 FGP2, 2250 M K330 . Transfer wing belts NGG 2250 FTTP2 for rectangular connections. Two buffer systems are known, tables and multi-track conveyors. For both solutions above mentioned chains/belts are suitable without any restrictions.
Shrink Packer
Wrap-around Packer
NGG
LFG
CR
LFG
NGG
LFG
NGG

Note: Critical curve sections for single lane conv. can be solved with EXTRA version for magnetic also for TAB series. EXTRA is a problem solver for mass conv., too. Nolu-S can be used as well. Wear strip in harder stainless steel versions for dry running and UHMW-PE for lubricated sections. Return rollers in "formula one" design. FG is recommended because Alu-oxid is very abrasive and the 40% open belt is easily cleanable!

Flexon System Plast GmbH Technical Support
Alfred-Nobel-Str. 4
68519 Viernheim
☎ (06204)9673-242

Plastic chain material

LF

- Standard light brown, also light grey and white
- Acetal (POM) with additives
- Standard material for beverage applications
- FDA

XPG

- Standard dark grey
- Acetal (POM) with additives – Teflon (PTFE) – for better sliding properties
- Suitable for applications which require better sliding properties than LF
- FDA

NG

- Standard green for chains, light grey for belts, also dark grey
- PBT plus additives
- Recommended for dry operation
- Heat resistant up to 120°C dry, 60°C wet
- UV resistant
- Low noise

Other materials: **AS** (antistatic), **HT** (high temperature), **CR** (chemical resistant), **AR** (abrasion resistant).

Steel chain material

Catalogue name	DIN spec.	AISI spec.
C45	**1.0503**	
Sandard	**1.4016**	**430**
Extra	**1.4589 E**	
Extra Plus	**1.4589 P**	
Extra Plus HB with hardened long life pin		
Austic	**1.4301**	**304**

C45 is not corrosion resistant, used in e.g. glass, ceramics, automotive, packaging industry

High hardness, long wear life in abrasive applications, high load capacity

STANDARD is acceptable for most bottling applications where there is little risk of acid attack and abrasion, e.g. mass/bulk conveying in bottling lines 40.000bph

Surface finish 0.6µm

EXTRA and **EXTRA PLUS** are generally recommended due to excellent strength and chemical as well as mechanical resistance, e.g. bottling lines over 60.000bph, pressure less combiners

Surface finish 0.3µm, Super Finish 0.2µm, extreme flatness offers best product stability

Additional alloy elements: Mo, Ni, Ti

HB *version features longer wear life*

AUSTIC offers best corrosion and excellent wear resistance, used in e.g. cold end glass lines, highly corrosive applications where there is massive acid attack

Surface finish 0.3µm

Nolu-Clean

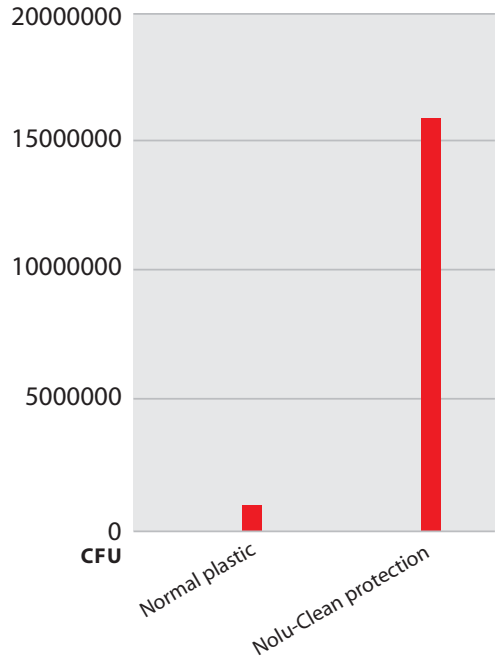
A new antimicrobial material for improved hygiene for a range of plastic chains, belts and conveyor components.

Hygiene has become an important issue in a number of areas in filling and packaging lines. To support the effectiveness of your cleaning efforts, System Plast offers the possibility to use Nolu-Clean with chains and a range of components.

Features:

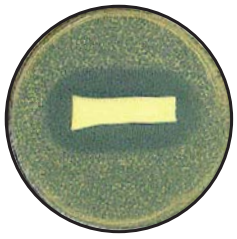
- Listed for industrial use in:
  - Australia
  - Canada
  - China
  - Korea
  - Philippines
  - USA
  - Japan
  - Europe
- Inhibits growth of:
  - Bacteria
  - Molds
  - Yeast
- Provides odor control and hygiene maintenance.
- Durable

Growth inhibition test



Bacterial growth test

Standard material



Nolu-Clean antimicrobial material

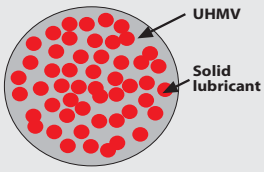
- Plastic chains
- Modular belts
- Flange bearings
- Brackets
- Other products on request.

Ask your System Plast contact for availability.

Nolu-S

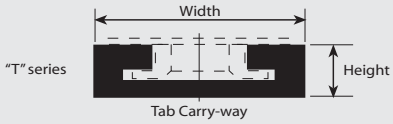
WHAT IS NOLU-S?

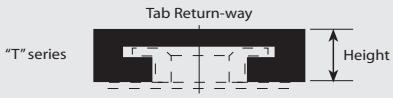
- Nolu-S material is a unique compound of UHMW and a solid lubricant.
- Drastically reduces the coefficient of friction, whilst maintaining the characteristics of UHMW.
- Nolu-S has a better thermal conductivity compared with UHMW.



Nolu-S curves

- Standard TAB curves
- Special curves
- Bevel curves
- Curves to customer drawing
- Magnetic corner tracks





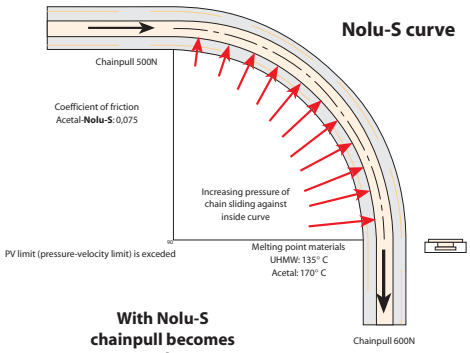
NOLU-S PRODUCTS

Machined products:
- Curves for chain
- Valu Guide profiles
- Chain tracks
- Side guides

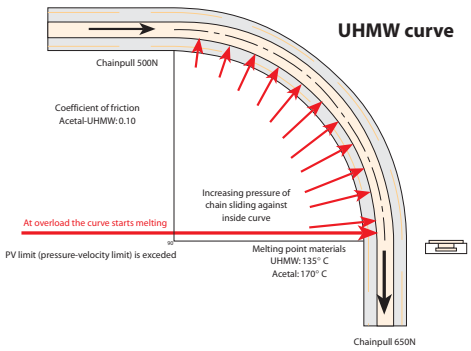
Nolu-S versus Nylatron

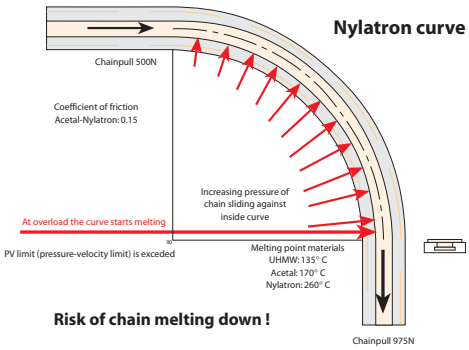
Nolu-S reduces chainp ull and avoids problems of overload in curves.

Other advantages of Nolu-S:
- Noise reduction
- Reduction chainpull- Longer chainlife
- Reduction chainpull - Reduced energy consumption
- Reduced stick-slip
- FDA approved base material and additives
- Suitable for running dry at higher speed (tested at 130M/min)



With Nolu-S chainpull becomes 25% less.





Risk of chain melting down !

Material instuction leaflets

Included in every chain package for costumer information / instruction.

Directions for use of our products made of NG material

NEW GENERATION is a modern High Performance plastic material based on PBT. It was exclusively developed for **FLEXON SYSTEM PLAST** for use in conveyors. Compared to other common plastic materials it distinguishes itself through excellent suitability for dry run applications.

Offers the following prominent and advantageous features:

- **Low coefficient of friction**, resulting in excellent suitability for dry run applications.
- **Reduced noise** (squeaking) through reduced slip stick effect.
- **Improved wear resistanc**e under normal operating conditions without influence of abrasives.
- **Improved chemical resistance** up to approx. 60°'a1C (140°'a1F).
- **Temperature capacity** in dry environment up to approx. 120°'a1C (248°'a1F), in humid environment up to ca. 60°'a1C (140°'a1F).

In case of any questions regarding usage of our products made of NG under your specific application conditions, please contact our technical support department.

We are not able to accept warranty claims, if at least one of the following limitations were applicable, or if limitations according to our written technical advice were not complied with.

MECHANICAL PROPPERTIES OF NG

For breaking loads of chains please refer to the **FLEXON SYSTEM PLAST** chain catalogue.

PERMISSIBLE OPERATING TEMPERATURESOF CHAINS MADE OF NG

permanent: approx. –40 to approx. +120°C (+248°F),
up to approx. +60°C (+140°F) in humid environment
peak, dry: +120 (+248) to max. +140°C (+284°F)

Catalogue data are valid for green standard material at ambient temperature. Other colours and higher temperatures may result in a reduction especially of the mechanical properties. In such cases we recommend tests under operating conditions.

ASSEMBLING PRODUCTS MADE OF NG

The assembly has to be done according to applicable technical standards in an appropriate way. Suitable tools have to be used.

RESISTANCE OF NG

Distinguishes itself compared to other common plastic materials through excellent chemical resistance. At ambient temperature it is according to our experience not affected by the following chemicals:
common cleaning agents and solvents • customary oil and grease • alcohol • petrol • water • aqueous neutral and sour salt solutions • diluted acids.
Additionally it is more resistant against UV- and high energetic radiation than other common plastic materials.

Is not resistant against: alkaline • concentrated oxidising acids.
Permanent use in aqueous media at temperatures above 50 (122) to 60°C (140°F) is not recommended.

The following table is an outline of the resistance catalogue. For further information please contact our technical support department.

Media	Cn.(%)	Temp.°C (°F)		Media	Cn.(%)	Temp.°C (°F)	
Ammoniac, aqueous	10	RT(AT)	👍	Natriumsalt, aqueous	10	RT(AT)	👍
Ammoniac, aqueous	10	60(140)	👎	Natriumsalt, aqueous	10	60(140)	👍to☞
Steam (water)	-	>100(212)	👍to👎	Rust-proofing oil	cust.	80(176)	👍
Steam sterilisation	-	134(273)	👍to☞	Saltpetre acid, aqueous	10	RT(AT)	👍
Disinfecting agents	-	-	-	Saltpetre acid, aqueous	10	60(140)	👎to☞
Alcohol	-	RT(AT)	👍	Saltpetre acid, aqueous	40	RT(AT)	👎
Chlorine, active	dil.	RT(AT)	👍	Hydrochloric acid, aqu.	10	RT(AT)	👍
Formaldehyde a. other	dil.	RT(AT)	👍	Mould	-	30(86)	👍
Phenol and derivatives	dil.	RT(AT)	👍to☞	Sulphuric acid, aqueous	10	60(140)	👍
Amphoteric tensides	dil.	RT(AT)	👍	Soap, aqueous	5	60(140)	👍
Food grease and oil	cust.	60(140)	👍	Soap, aqueous	5	80(176)	👎
Lubric. oil w/out additives	cust.	80(176)	👍	Silicone oil & grease	cust.	100(212)	👍
Fluor hydrocarbons	cust.	60(140)	👍	Washing-up liquid	dil.	70(158)	👍
Hydraulic liquids	cust.	60(140)	👍	Toilette cleaning liquid	dil.	RT(AT)	👍
Kaliumchlorides, aqueous	10	60(140)	👍	Water	-	60(140)	👍
Kaliumhydroxide, aqueous	1	RT(AT)	👎	Water	-	70(158)	👍to☞
Natriumhydroxide, aqueous	1	RT(AT)	👎	Citric acid, aqueous	10	RT(AT)	👍
Natriumhypochloride, aqu.	10	RT(AT)	👍	Juice	cust.	RT(AT)	👍
Natriumhypochloride, aqu.	10	60(140)	☞				

Especially regular use of aqueous alkaline cleaning solvents, that are sprayed on with steam cleaners that are not equipped with steam/condense temperature control/limitation, may have negative impact on the material properties.

👍resistant 👎 not resistant
☞only short contact duration permitted

SYSTEM PLAST • FLEXON SYSTEM PLAST

Attention

Contact between this product made of Polyacetal and liquids with a pH value below 4,5 or above 9,0 is not recommended in order to avoid chemical attack. Take care with strong cleaning agents, especially when they contain chlorine, ammonia or phosphoric acid.

Achtung

Bitte vermeiden Sie den Kontakt zwischen diesem Produkt aus Polyazetal und Flüssigkeiten mit einem pH Wert unter 4,5 oder über 9,0 um einen chemischen Angriff vorzubeugen. Vorsicht bei Verwendung von aggressiven Reinigungsmitteln, vor allem wenn diese Chlor, Ammoniak oder Phosphorsäure enthalten.

Attenzione

Al fine di evitare aggressioni chimiche durante l'impiego, s'informa che, il contatto tra questo prodotto realizzato in resine Poliacetaliche e liquidi con valore pH inferiore a 4,5 o superiore a 9,0 è assolutamente sconsigliato. Si raccomanda estrema attenzione all'uso di potenti detergenti, specialmente quando contengono Ammoniaca, Acido Fosforico o cloro.

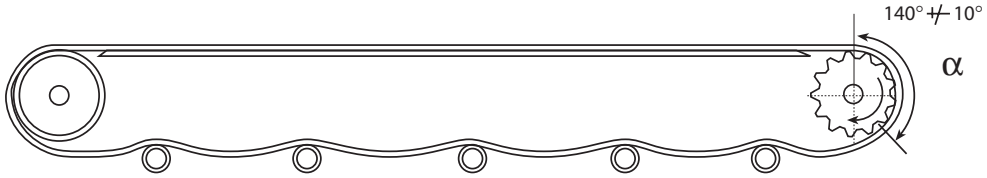
Внимание

Не рекомендуется обработка полиацеталя (POM) жидкостями с водородным показателем ниже 4,5 и выше 9,0 во избежание химической реакции. Осторожно используйте в сочетании с сильными реагентами, особенно если они содержат хлорин, аммиак и фосфорную кислоту.

COSTRUCTION DETAILS

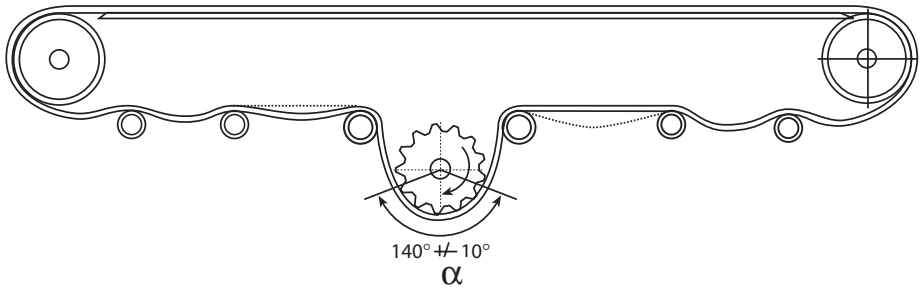
Drive Construction

End drive



Usually used for one-directional applications.
Preferred running direction of chain has to be considered.

Centre drive

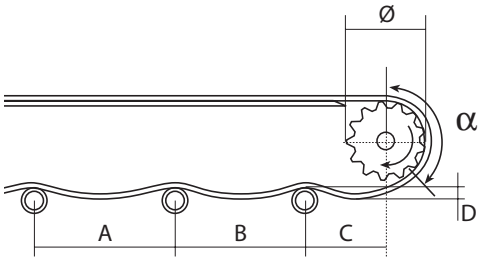


Usually used for bi-directional applications or when space for catenary sag or drive construction is limited.
Commonly used for accumulation tables.
Chains without preferred running direction are recommended.

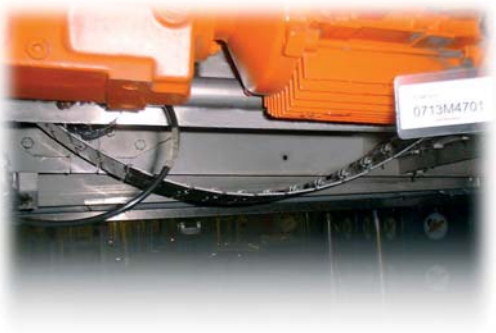
Wrap around angle α

Recommended angle on sprockets is 140° +/- 10°.
Too small angles result in chain/belt jumping on the sprocket.
Too big angles result in chain/belt sticking to the sprocket.

Catenary sag



Discharges the chain load.
Releases chain properly from the sprocket.



typical catenary sag

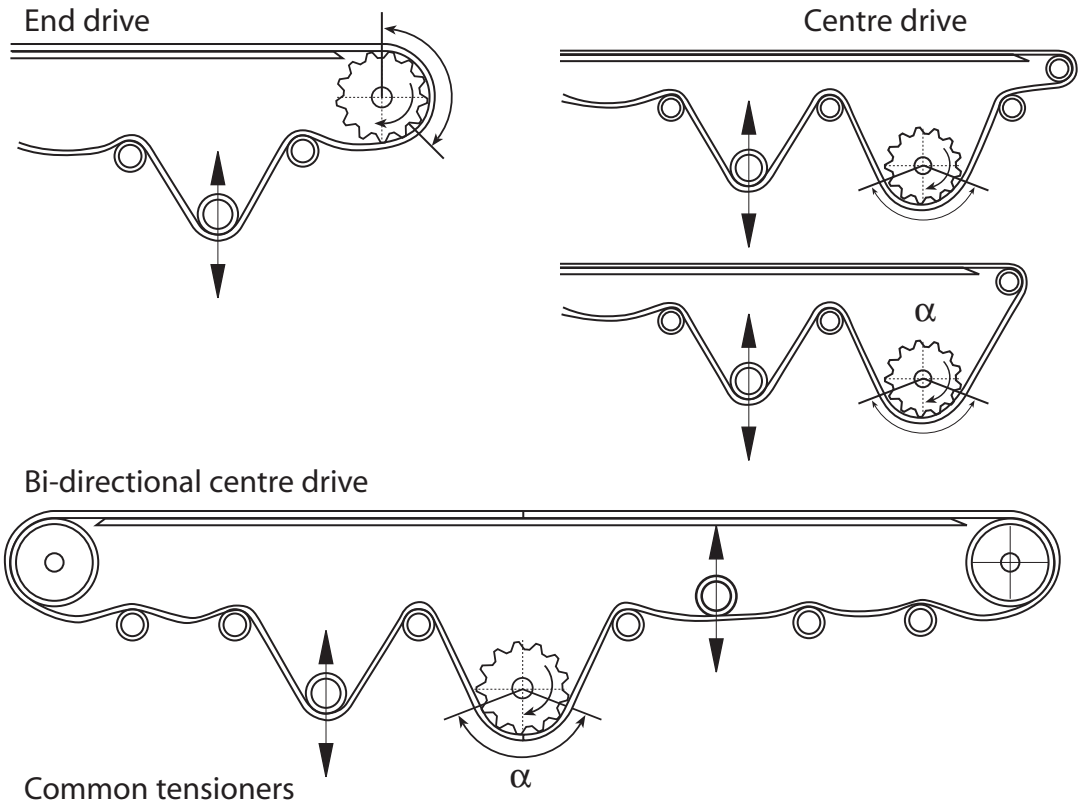
Recommended dimensions

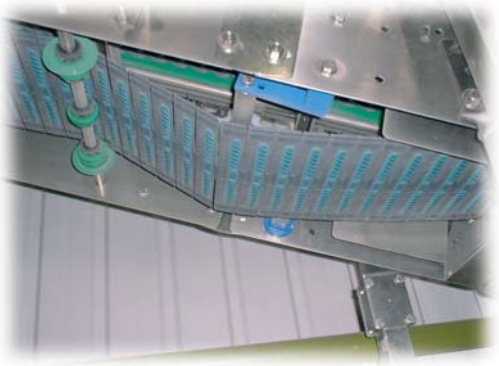
Chain/Belt	C [mm]	B [mm]	A [mm]	D [mm]
Chains	500-900	400-550	-	50-125
LBP chains	600-900	400-550	450-600	50-150
belts	600-900	500-700	500-700	50-125

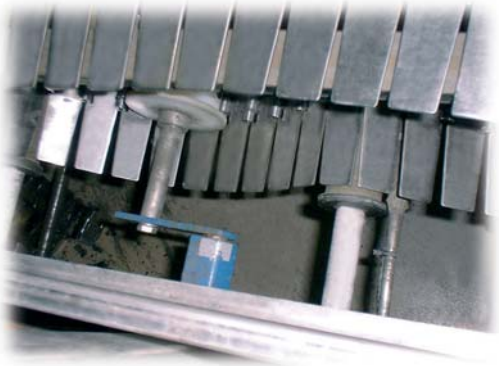
Speed, start-up frequency and drive control must be considered for the design of catenary sags. Catenary sag should be checked and adjusted regularly due to chain elongation. In any case the length of the catenary sag (C) must be longer than dimensions A and B.

Tensioner

If no proper catenary sag construction is possible, e.g. in case of insufficient space, tensioners are used.







Roller dimensions

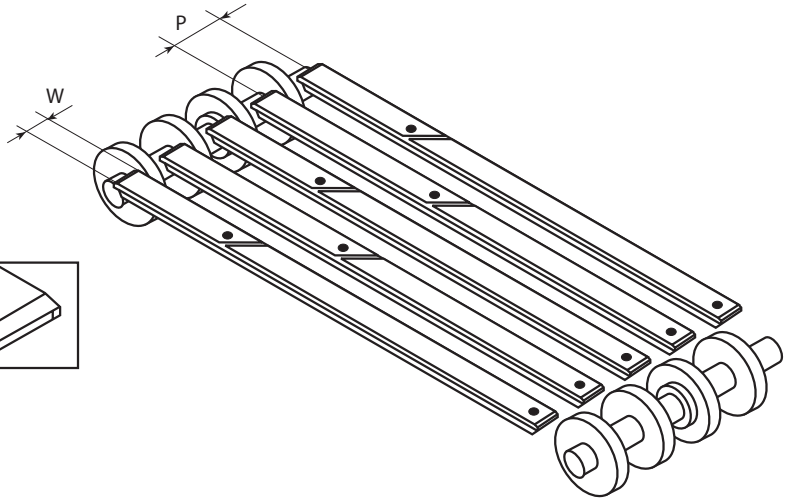
In order to reduce the size of transfer plates the following roller dimensions are recommended.

Roller type	Chain [mm]	Belt [mm]
Idler roller	>100	>25
Return roller	>50	>50
Backflex roller	300	>80

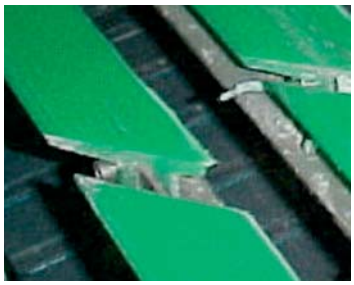
Wear strips

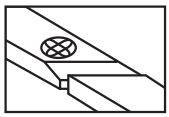
Construction

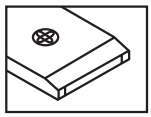
Parallel wear strips – *chains & belts*



More suitable for bi-directional applications.
Suitable for belts with Positioner.

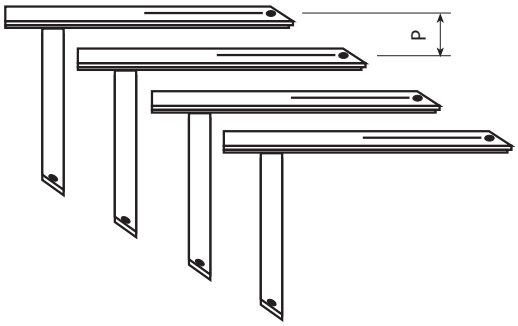






Chevron/herringbone wear strips - belts

Advantage: even belt wear.



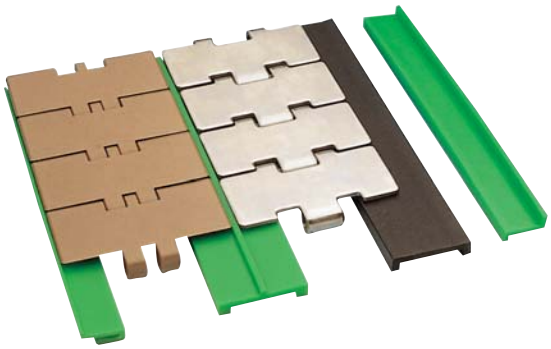
P = pitch between wear strips.
W >= 40mm recommended.

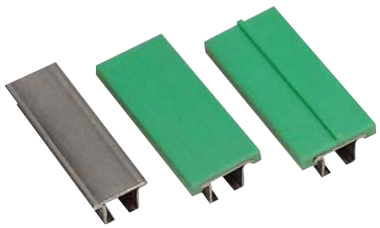
Recommended pitch for belts:

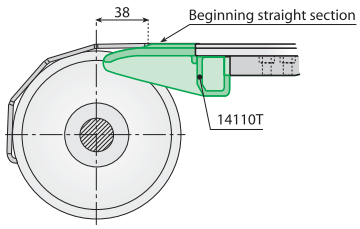
- 85-170 mm / 3"-6" (imperial belt sizes)- parallel
- 100-300 mm - chevron/herringbone

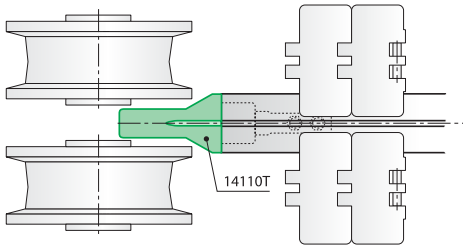
In combination with chains the pitch depends on the chain type.

Examples







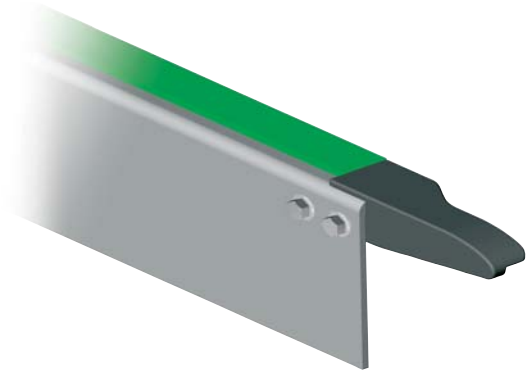


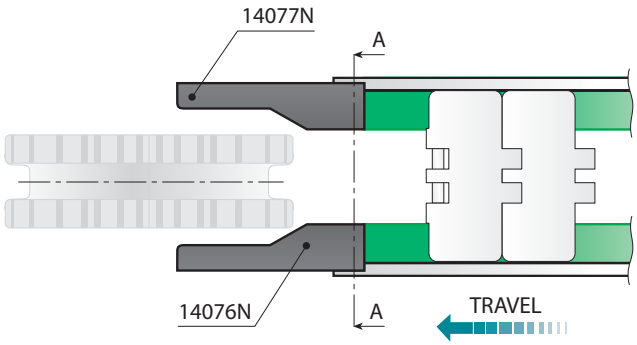
For chains wider than 7.5" it is recommended to install 2 wear strips on each side of the chain:
1 close to the hinge plus 1 at the end of the plate.

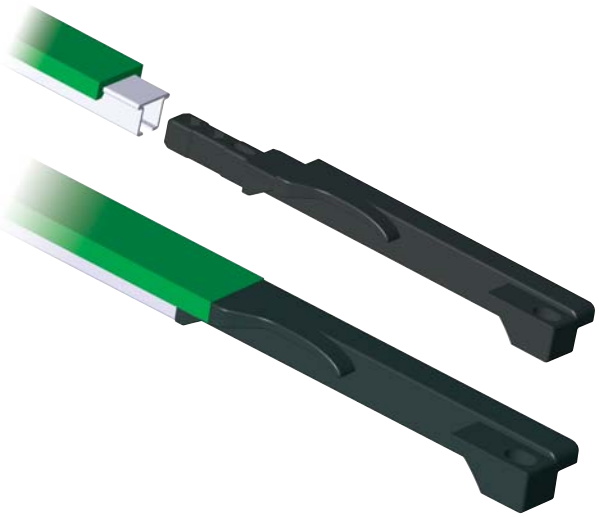
For belts which are side-guided with wear strips (Z-cross section), a clearance between the edge of the belt and the side-guide wear strip is recommended in order to cover possible heat elongation of the belt width.

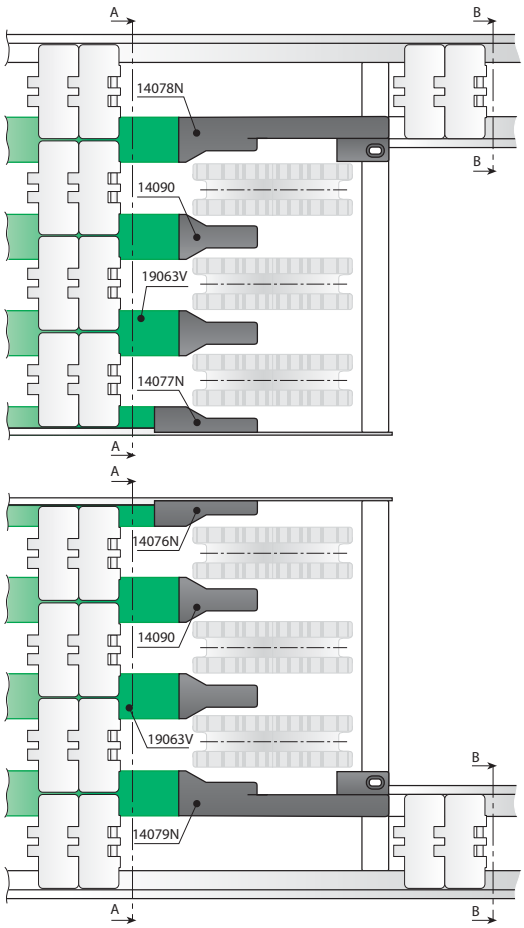
For belts with Positioners wear strips are arranged according to the location of the Positioners.

Wear strip shoes are recommended for smooth transfer of the chain onto the wear strip.









Selection of wear strip material

Guideline

Wear strip material	Steel chains		Plastic chains & belts	
	dry	lubricated	dry	lubricated
UHMWPE	recommended	recommended	satisfactory for: <60 m/min	recommended
NOLU-S	recommended	not necessary	recommended	not necessary
Polyamide	satisfactory	not recommended	recommended	not recommended
Stainless steel	not recommended	not recommended	recommended	recommended
Carbon steel	not recommended	not recommended	satisfactory	not recommended

Temperature limits of wear strip materials must be considered.

UHMWPE
- to be used in non-abrasive conditions
- temperature limit 60°C
- thermal expansion to be considered

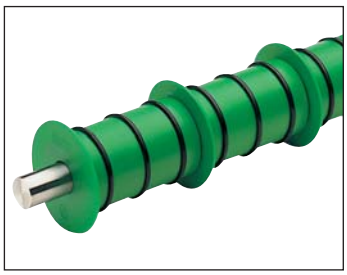
NOLU-S
- UHMWPE with built in dry lubricant
- offers even lower coefficent of friction and less noise emission than standard UHMWPE
- basic material properties are similar to UHMWPE

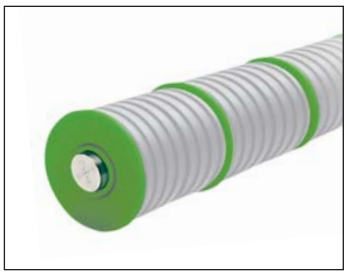
Polyamide
- to be used in non-abrasive/slightly abrasive conditions
- temperature limit 120°C
- absorption of humidity to be considered

Stainless steel
- recommended for abrasive conditions
- hardness of 25-30 HRC is recommended
- roughness of max. 1.6µm is recommended

Return part construction

Rotating rollers

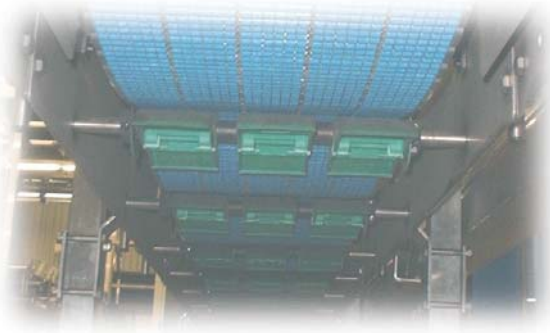




Free rotation required.
Big diameters recommended.

+Reduced wear of chain/belt.
+Debris is ejected.
+Reduced noise with O-rings/rubber coating.
+Improved grip with grooved rubber coating.
+Improved wear resistance and further improved grip with urethane coating.
+Machined versions for heavy duty and hygienic applications.

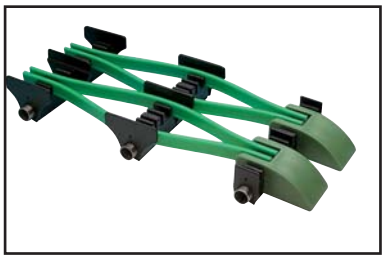
Guide shoes

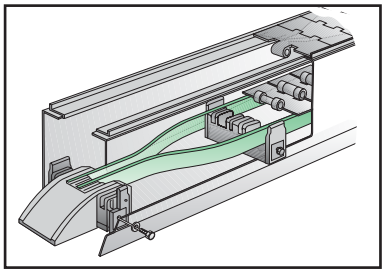


Radius >200 mm.

+Suitable for LBP chains/belts.
+Debris is ejected.
+Low noise version available.

Wear strips





UHMWPE recommended.

+Reduced noise.
+Full support.
+Even wear.

Chains/belts with high friction surface

Sprockets and Idler wheels

For detailed information please refer to Conveyor Chains Catalogue.
Sprockets and idler wheels are available in different executions:

- Split
- Standard
- Moulded
- Machined
- Round bore
- Round bore with key seat DIN 6885
- Square bore
- With guide rings
- With hub in stainless steel AISI 304
- With low friction bushing

Examples

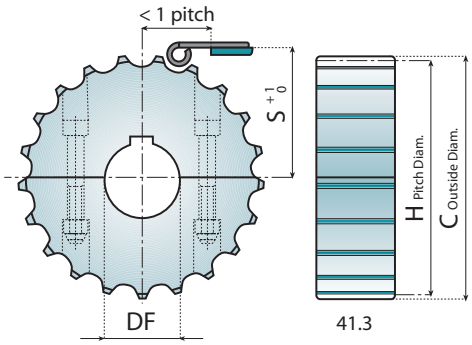
Sprocket position

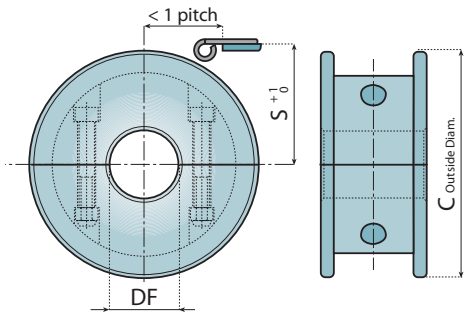
Wearstrip position

S distance centre of sprocket to top of wearstrip

H pitch diameter of sprocket
C outside diameter of sprocket
DF bore diameter

Distance centre of sprocket to end of wearstrip should be maximum 1 pitch.





Shafts

Stainless steel is recommended in every case.
Sufficient hardness (> 25 HRC) as well as smooth surface is recommended.

For chains usually round shafts are used, for belts round or square shafts.

Shaft tolerances for chain sprockets

Sprocket	Tolerance	Remark
Split sprocket, round bore, key seat	P9	Fixed seat
Sprocket, round bore, key seat	H7	Fixed to slightly movable seat
Split idler wheel, round bore	+0.2/+0.4	Movable
Idler wheel, round bore	+0.2/+0.4	Movable
Split Sprocket, round bore, stainless steel hub	F7	Movable

Key seat DIN 6885

Shaft tolerances for belt sprockets

Sprocket	Tolerance	Remark
Split sprocket, round bore, key seat	P9	Fixed seat
Sprocket, round bore, double key seat	0.3/0.5	Movable
Split sprocket, square bore	0.3/0.5	Movable
Sprocket, square bore	0.3/0.5	Movable
Sprocket for series 2120, round bore, key seat	H7	Fixed to slightly movable seat
Idler wheels	0.3/0.5	Movable

Key seat DIN 6885

Sprocket position for BELT

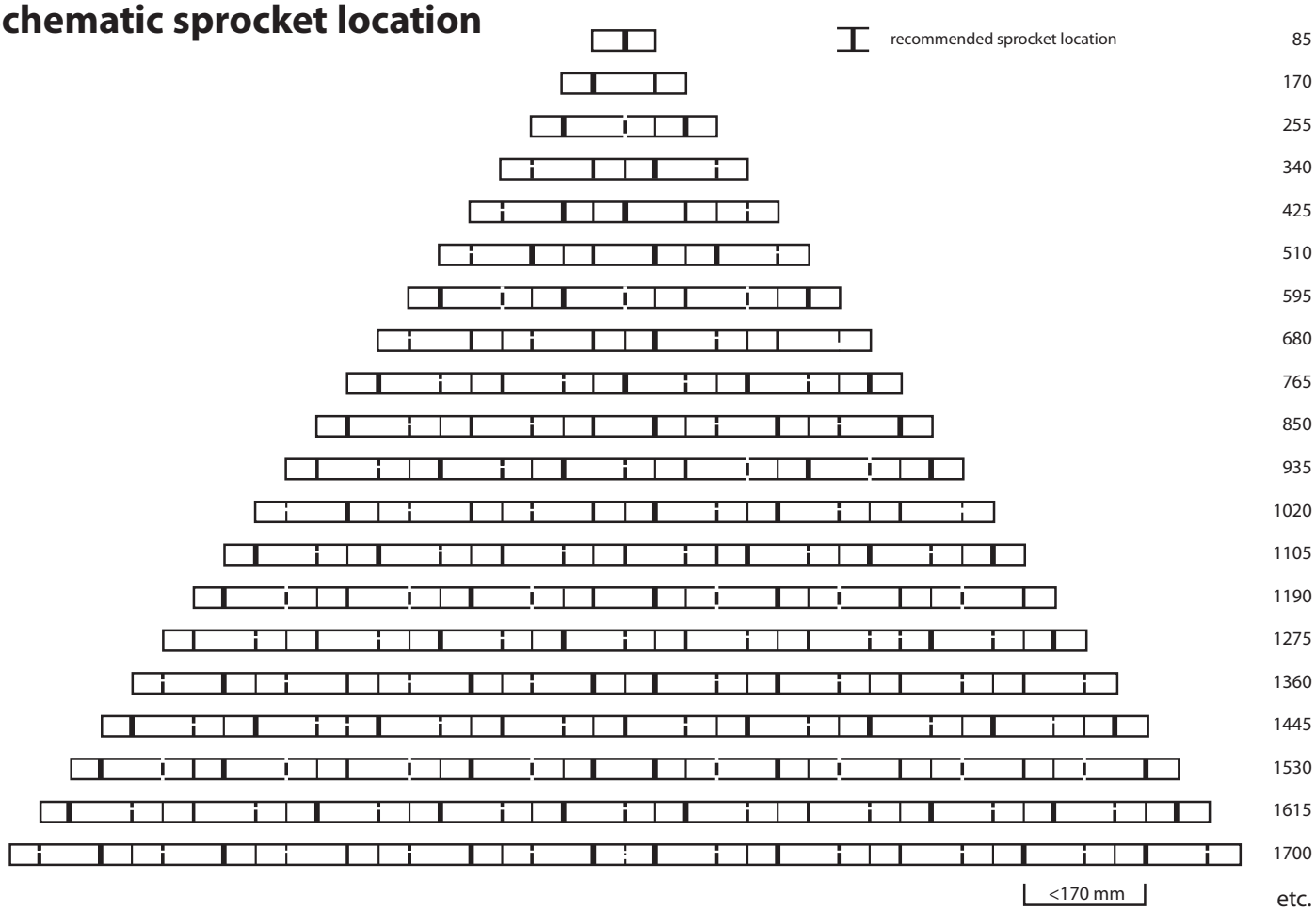
Recommendation:

- Use identical sprockets for the drive end as well as for the idler end.
- Use identical number of sprockets for drive and idler end.
- Maximum distance between sprockets is 170 mm/6".
- Sprockets should be located symmetrically to the middle axis of the belt.
- Only centre sprocket should be fixed using collars. The rest of the sprockets should be able to move sideways on the shaft in order to compensate temperature elongation of the belt.

For all belt types (2120, 2121, 2250, 2251, 2252) the recommended number of sprockets is identical.

Nominal belt width Series 2120, 2121 2250, 2251, 2252		**Recommended number of drive / number sprockets**	**Maximum possible idler of drive / idler sprockets**
85	3" (76.2 mm)	1	1
170	6" (152.4 mm)	2	2
255	9" (228.6 mm)	2	3
340	12" (304.8 mm)	2	4
425	15" (381 mm)	3	5
510	18" (457.2 mm)	4	6
595	21" (533.4 mm)	4	7
680	24" (609.6mm)	4	8
765	27" (685.8 mm)	5	9
850	30" (762 mm)	6	10
935	33" (838.2 mm)	6	11
1020	36" (914.4 mm)	6	12
1105	39" (990.6 mm)	7	13
1190	42" (1066.8 mm)	8	14
1275	45" (1143 mm)8	8	15
1360	48" (1219.2 mm)	8	16
1445	51" (1295.4 mm)	9	17
1530	54" (1371.6 mm)	10	18
1615	57" (1447.8 mm)	10	19
1700	60" (1524 mm)	10	20
etc.			

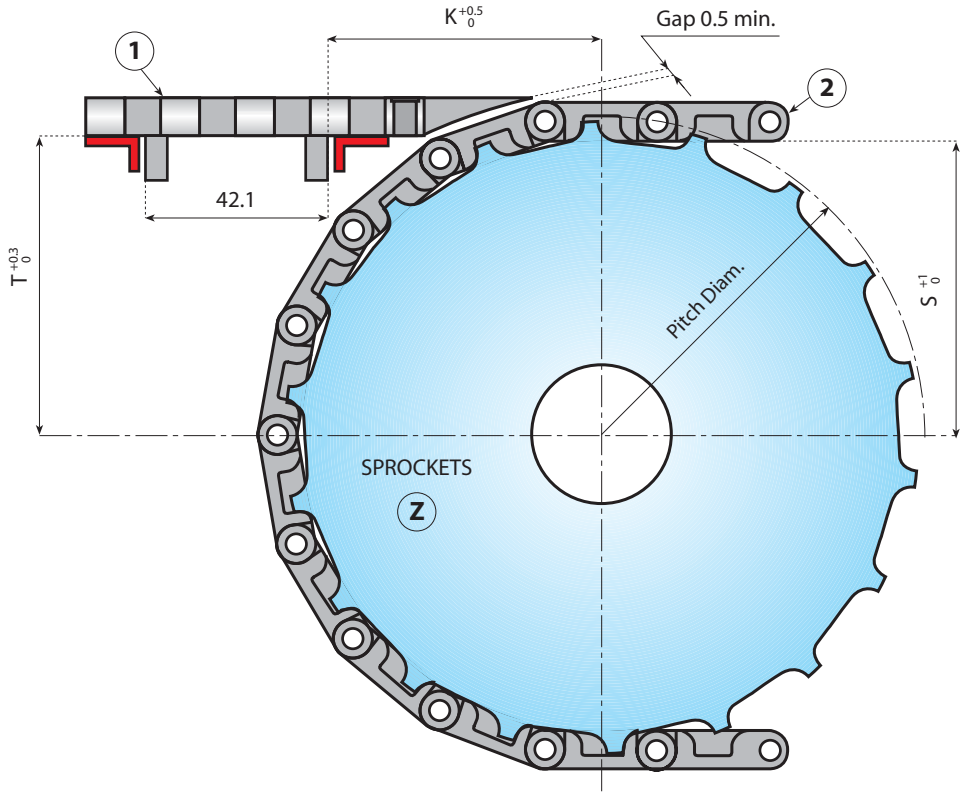
Schematic sprocket location



Active transfer wing with two positioners

This is a system of integrated, taper ed flights at the edge of the belt which allows for smooth 90° transfers without deadplates resulting in a aself clearing construction.
the active transfer system is always equipped with the positioner which ensures an optimum tracking of the belt at the 90° transfer.

We recommend making the returnshaft adjistable in X-and Y-direction within a range of some millimeters



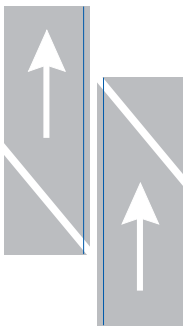
For further engineering information on application of the specified belts, please contact our Engineering Department.

BELTS with TRANSFER WING (Ref. n°1)	BELTS (Ref. n°2)	SPROCKETS Number of teeth Z.	DIMENSIONS		
			K (mm)	S (mm)	T (mm)
2120 FTTP2	2120 FT	16	55.2	28.2	28.2
		20	56.4	36.3	36.3
		24	57.5	44.3	44.3
		28	59.5	52.4	52.4
2250 FTTP2 or 2250 FGTP2	2120 FT	16	55.5	28.2	28.2
		20	56.6	36.3	36.3
		24	57.6	44.3	44.3
		28	60.1	52.4	52.4
2251 FTTP2	2120 FT	16	72.9	28.2	24.2
		20	74.5	36.3	32.3
		24	75.5	44.3	40.3
		28	77.2	52.4	48.4
2250 FTTP2 or 2250 FGTP2	2250 FT or 2250 FG	12	58.6	44.7	44.7
		16	60.7	60.7	60.7
		18	61.6	68.8	68.8
		20	62.4	76.8	76.8
2251 FTTP2	2250 FT or 2250FG	12	76.9	44.7	40.7
		16	78.8	60.7	56.7
		18	79.4	68.8	64.8
		20	80.3	76.8	72.8
2251 FTTP2	2251 FT	16	79.5	58.7	58.7
		18	80.2	66.7	66.7
		20	80.5	74.8	74.8
		21	81.4	78.9	78.9

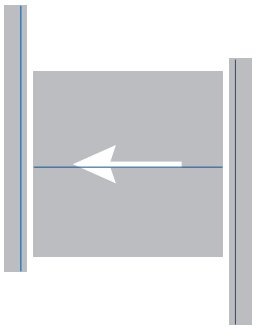
The same dimensions are applicable for belts series 2121 and 2252.

BELT with Positioner

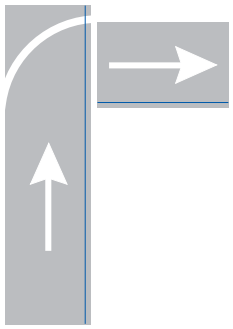
Positioner belts are recommended for applications where forces occur from sideways on the belt.



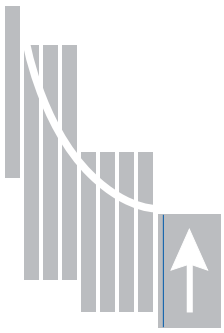
side transfer



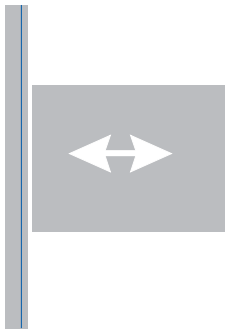
infeed/outfeed



rectangular transfer



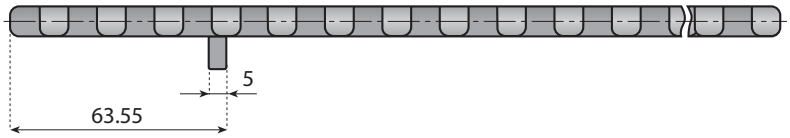
inliner/pressureless combiner



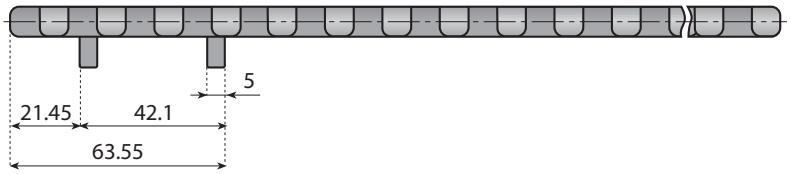
discharge palletizer or accumulation table

Positioners are available for all BELT series.

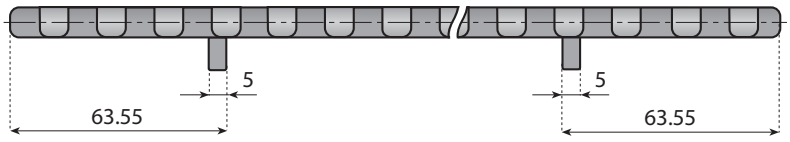
Location of Positioners



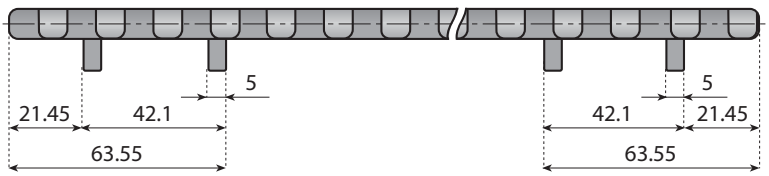
Example 2250 FT P1 standard execution



Example 2250 FT P2 standard execution



Example 2250 FT P2 B



Example 2250 FT P2 BD

Other locations of Positioners are available on request.
Please contact our engineering department for detailed information.

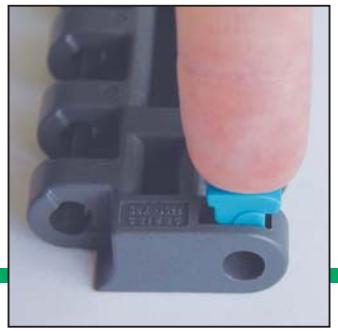
MODULAR BELTS

Instructions for clip assembling/disassembling (currently for all types of modular belts)
Anweisungen für Clip-Montage/Demontage (gültig für alle Ausführungen)

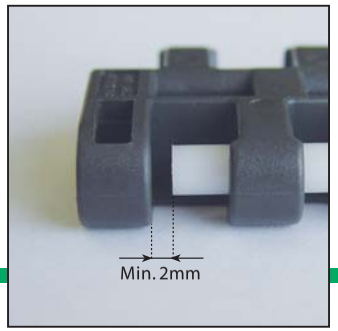
GOOD

GUT

Picture/Bild 1:
- Correct clip position
- *Richtige Lage des Clip*



Picture/Bild 2:
- Clips can be forced in or hand assembled
- *Eindrücken des Clip oder Montage von Hand*

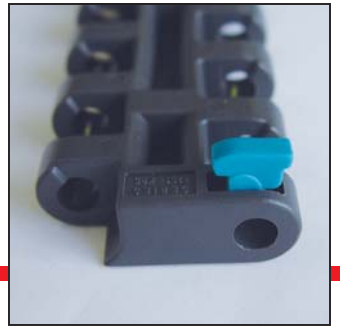


Picture/Bild 3:
- Correct pin length
- *Korrekte Länge des Bolzens*

Picture/Bild 4:
- Clips can be disassembled with a small screwdriver
- *Demontage des Clip mit kleinem Schraubenzieher*

BAD

SCHLECHT



Picture/Bild 5:
- Wrong clip position
- *Falsche Lage des Clip*

Picture/Bild 6:
- Do not beat clips in!
- *Clip nicht einschlagen!*

Picture/Bild 7:
- Wrong pin length
- *Falsche Länge des Bolzens*

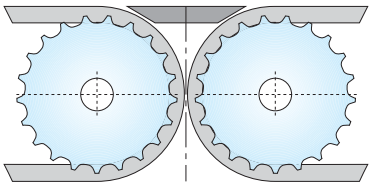
Picture/Bild 8:
- Broken modules must be replaced immediately!
- *Modul gebrochen, Teil unbedingt auswechseln!*

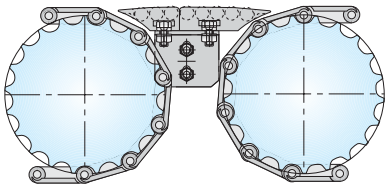
Flexon System Plast GmbH Tel. (+49) 3529.56.15.0 - Fax (+49) 3529.51.13.67 - www.systemplast.com - info@fspchains.com

Transfer

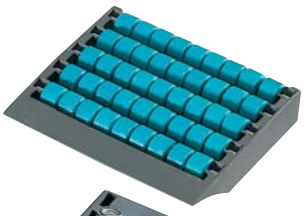
For **side transfers** a gap, that is as small as possible, is recommended to prevent adjacent chains or belts to climb on each other e.g. in case of temperature elongation. The gap should cover the tolerances of the chain or belt guides.K330 (83,8mm) wide chains/belts already offer reduced side gaps.

For dead **plate transfers** our 2120/2121 belt series is recommended because the gap between the adjacent belts is reduced to a minimum.



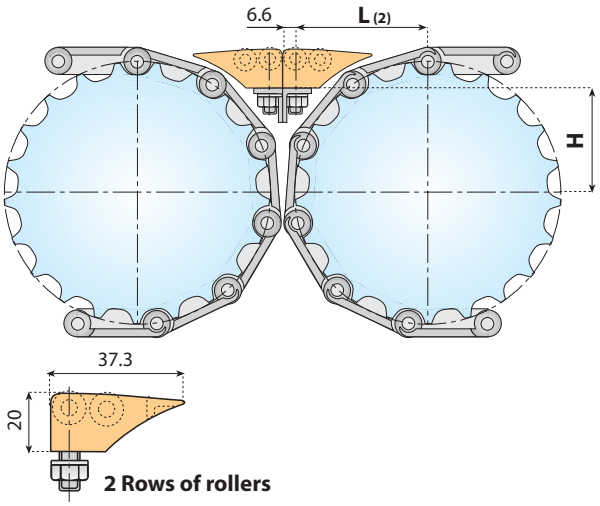


Example: Standard dead plate modular roller dead plate

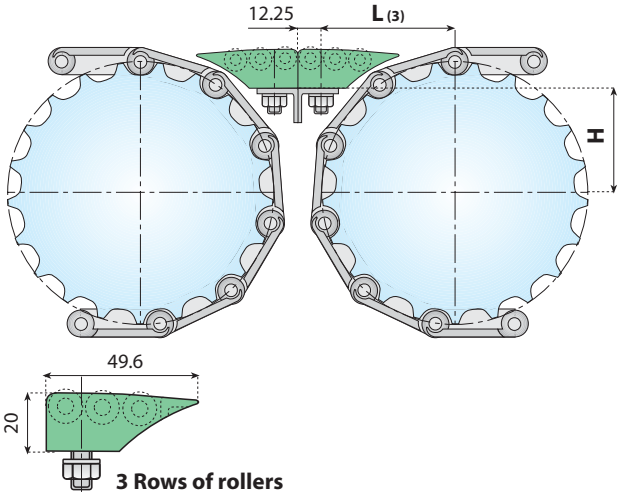


Low friction version with rollers supported in ball bearings

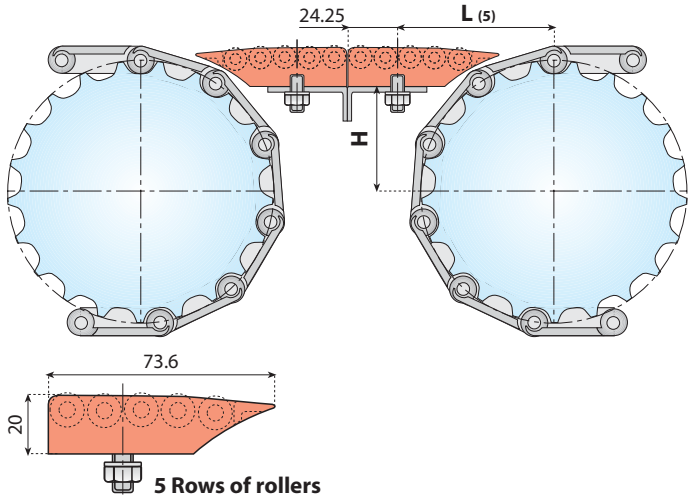
Assembly



2 Rows of rollers

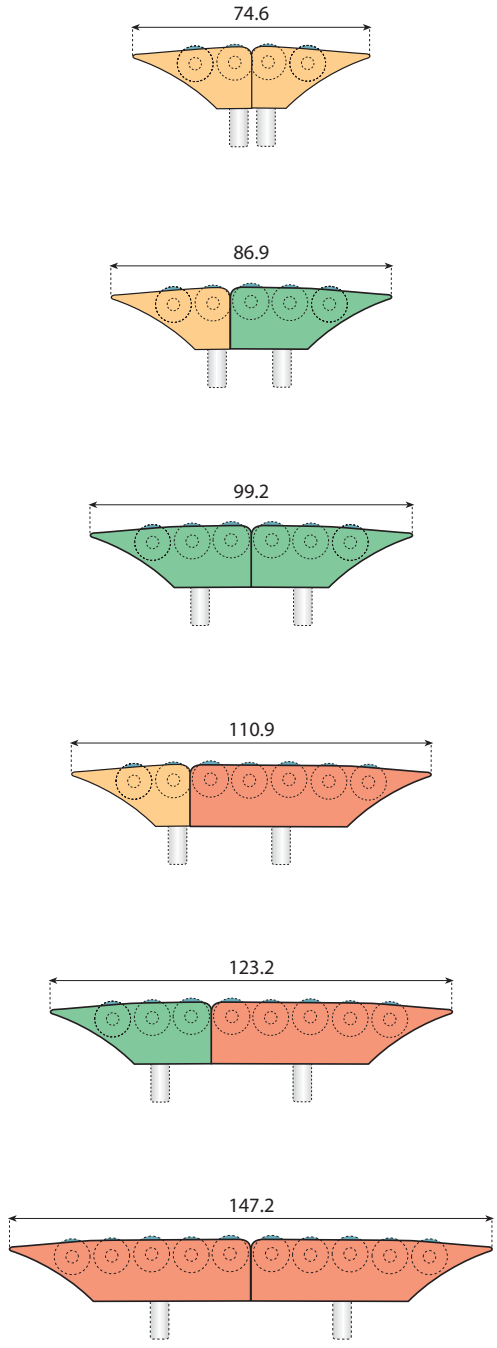


3 Rows of rollers



5 Rows of rollers

Combinations



Head to tail transfer with two modules

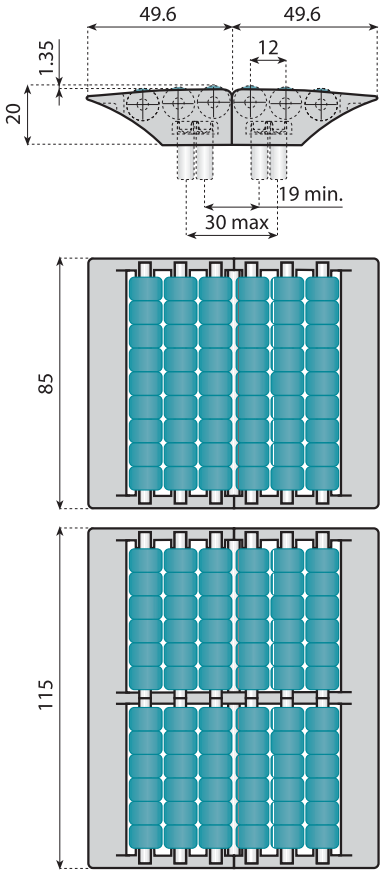
CHAIN TYPES	Sprockets Z=15				Sprockets Z=17				Sprockets Z=19				Sprockets Z=21				Sprockets Z=23				Sprockets Z=25				Sprockets Z=27				Sprockets Z=29			
	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)
812-815-800-802-805-8157	34.4	56.9	61.6	74.6	40.3	58.3	62.8	75.8	46.3	61	64	77	52.2	63.8	65.1	78.1	58.2	66.4	66.2	79.2	64.2	68.9	67.2	80.2	70.2	71.3	68.2	81.2	76.2	73.6	69.2	82.2
881-8810-881TAB-8810TAB-881M 881MO-8857M-8857TAB	34.4	56.9	61.6	74.6	40.3	58.3	62.8	75.8	46.3	61	64	77	52.2	63.8	65.1	78.1	58.2	66.4	66.2	79.2	64.2	68.9	67.2	80.2	70.2	71.3	68.2	81.2	76.2	73.6	69.2	82.2
512-515	48.7	62.1	64.4	77.4	56.7	65.7	65.8	78.8	63.8	69.1	67.3	80.3	72.8	72.3	68.6	81.6																
1874	40.8	65.1	70.3	83.3	46.8	65.4	71.8	84.8	52.9	68.3	73.3	86.3	59.8	71	74.6	87.6	65	73.7	76	89	71	76.2	77.3	90.3								
820-SK38	35	57.7	62.4	75.4	40.9	59.1	63.7	76.7	46.9	61.7	64.9	77.9	52.8	64.4	66	79	58.8	67.1	67.1	80.1	64.8	69.6	68.2	81.2	75.4	67.4	69.2	82.2	76.8	74.3	70.2	83.2
831	35.8	57.7	62.4	75.4	41.7	59.1	63.7	76.7	47.7	61.7	64.9	77.9	53.6	64.4	66	79	59.6	67.1	67.1	80.1	65.6	69.6	68.2	81.2	76.2	67.4	69.2	82.2	77.6	74.3	70.2	83.2
821	35.8	58.1	62.8	75.8	41.7	59.5	64.1	77.1	47.7	62.2	65.3	78.3	53.6	64.9	66.4	79.4	59.6	67.5	67.6	80.6	65.6	70	68.6	81.6	76.2	72.4	69.7	82.7	77.6	74.8	70.7	83.7
843	20.6	57.4	62.9	75.9	24.7	58.7	64.1	77.1	28.7	59.9	65.2	78.2	32.7	61.1	66.3	79.3	36.8	62.2	67.3	80.3	40.5	63.3	68.3	81.3								
863	40.8	65.3	70.5	83.5	46.8	65.5	72	85	52.9	68.4	73.5	86.5	58.9	71.2	74.9	87.9	65	73.8	76.2	89.2	71	76.4	77.5	90.5								
1843	21.4	55.6	60.9	73.9	25.5	56.8	61.9	74.9	29.5	57.9	63	76	33.5	59	63.9	76.9	37.5	60	64.9	77.9	41.6	61	65.8	78.8								
1873	41.1	60.8	65.7	78.7	47.1	62.7	67	80	53.5	65.5	68.2	81.2	59.2	68.2	69.4	82.4	65.3	70.8	70.6	83.6	71.3	73.2	71.7	84.7	77.3	75.6	72.7	85.7				
815VG-805VG-8157VG (with rubber)	37.4	57.3	62.1	75.1	43.3	58.7	63.3	76.3	49.3	61.4	64.5	77.5	55.2	64.2	65.6	78.6	61.2	66.8	66.7	79.7	67.2	69.3	67.7	80.7	73.2	71.7	68.7	81.7	79.2	74	69.7	82.7
831VG-821VG	38.8	57.4	62.1	75.1	44.7	58.8	63.4	76.4	50.7	61.5	64.6	77.6	56.6	64.2	65.7	78.7	62.6	66.8	66.9	79.9	68.6	69.3	67.9	80.9	79.2	71.7	69	82	80.6	74.1	70	83
1873VG	44.9	59.1	63.5	76.5	50.9	62.7	64.7	77.7	57	65.4	65.8	78.8	63	67.9	66.3	79.3	69.1	70.4	67.8	80.8	75.1	72.8	68.8	81.8	81.1	75.1	69.8	82.8				
LBP 831	50.3	62.7	64.3	77.3	56.2	65.3	65.4	78.4	62.2	67.9	66.4	79.4	68.1	70.3	67.5	80.5	74.1	72.6	68.4	81.4	80.1	74.9	69.4	82.4								
LBP 821	50.3	63.1	64.7	77.7	56.2	65.7	65.8	78.8	62.2	68.3	66.8	79.8	68.1	70.7	67.9	80.9	74.1	73	68.8	81.8	80.1	75.3	69.8	82.8								

CHAIN TYPES	Sprockets Z=9				Sprockets Z=10				Sprockets Z=11				Sprockets Z=12				Sprockets Z=13				Sprockets Z=14				Sprockets Z=15			
	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)
8257VG	46.2	61	63.9	76.9	52.1	63.7	65.1	78.1	58.1	66.3	66.1	79.1	64.1	68.8	67.2	80.2												
LBP 8257	60.7	67.4	66.6	79.6	66.6	69.9	67.6	80.6	72.6	72.2	68.6	81.6	78.6	74.5	69.5	82.5												
878TAB-879-879TAB-879M 880-880TAB-880M	44.3	59.2	63.6	76.6	50.2	62.9	64.7	77.7	56.2	65.5	65.8	78.8	62.2	68.1	66.9	79.9	68.2	70.5	67.9	80.9	74.2	72.9	68.9	81.9	80.2	75.1	69.8	82.8
882-882TAB-882M	46.2	61	63.9	76.9	52.1	63.7	65.1	78.1	58.1	66.3	66.1	79.1	64.1	68.8	67.2	80.2												
878TAB VG- 879TAB VG- 879M VG	47.4	61	64	77	53.2	63.8	65.1	78.1	59.2	66.4	66.2	79.2	65.2	68.9	67.2	80.2	71.2	71.3	68.2	81.2	77.2	72.8	69.2	82.2				
882M VG- 882TAB VG	49.2	62.2	64.3	77.3	55.1	64.8	65.4	78.4	61.1	67.4	66.5	79.5	67.1	69.9	67.5	80.5												
LBP 878TAB- LBP 879 M	59.6	61.7	66.1	79.1	65.5	65.4	67.2	80.2	71.5	68	68.3	81.3	77.5	70.6	69.4	82.4	83.5	73	70.4	83.4	89.5	75.4	71.4	84.4	95.5	77.6	72.3	85.3
LBP 882TAB- LBP 882M	60.7	67.4	66.6	79.6	66.6	69.9	67.6	80.6	72.6	72.2	68.6	81.6	78.6	74.5	69.5	82.5												

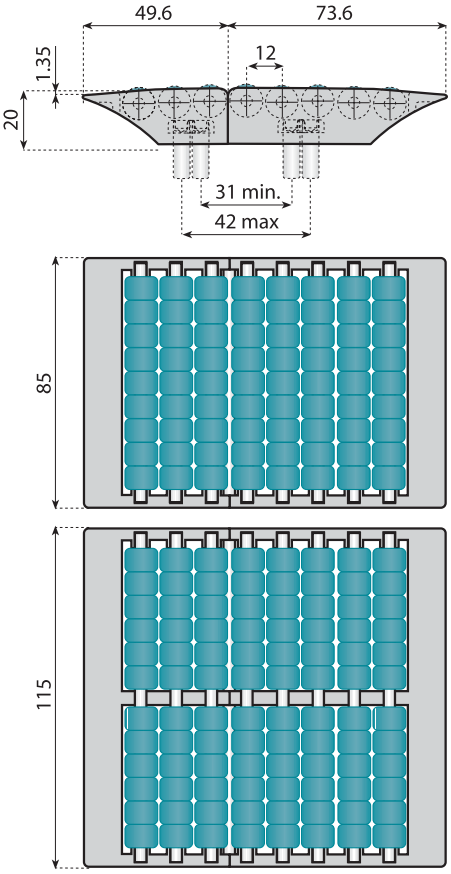
BELT TYPES	Sprockets Z=12				Sprockets Z=16				Sprockets Z=18				Sprockets Z=20				Sprockets Z=21				Sprockets Z=24				Sprockets Z=28			
	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)
series 2120 FT - 2121 FT					16.65	50.9	57.3	69.3					24.8	53.8	60.2	72.2					32.9	55.9	62.3	74.3	41.1	58.3	64.7	76.7
series 2120 VG					18.65	51.1	57.5	69.5					26.8	54	60.4	72.4					34.9	56.1	62.5	74.5	43.1	58.5	64.9	76.9
series 2120 LBP					29.65	51.4	57.8	69.8					37.8	54.3	60.7	72.7					45.9	56.4	62.8	74.8	54.1	58.8	65.2	77.2
series 2250 FT - 2250 FG	32.5	57.2	63.6	75.6	48.55	60.3	66.7	78.7	56.55	63.6	70	82	64.7	64	70.4	82.4												
series 2251 FT - 2252 FT					50.5	63.3	69.7	81.7	57.95	63.6	70	82	65.75	66.3	72.7	84.7	69.8	66.2	72.6	84.6								
series 2251 VG					53	63.7	70.1	82.1	60.45	64	70.4	82.4	68.25	66.7	73.1	85.1	72.3	66.6	73	85								
series 2251 LBP					65	64.05	70.45	82.45	72.35	64.35	70.75	82.75	80.2	67.05	73.45	85.45	84.3	66.95	73.35	85.35								

CHAIN-BELT TYPES	Sprockets Z=16				Sprockets Z=18				Sprockets Z=19			
	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)	H	L(2)	L(3)	L(5)
series 2250M-FT - 2250M-FG	54.8	66.4	72.8	84.8	62.8	70	76.4	88.4	67.8	73.6	80	92
series 2251M-FT - 2251M-FG	58.8	68.1	74.5	86.5	66.8	71.4	77.8	89.8	71.8	74.2	80.6	92.6

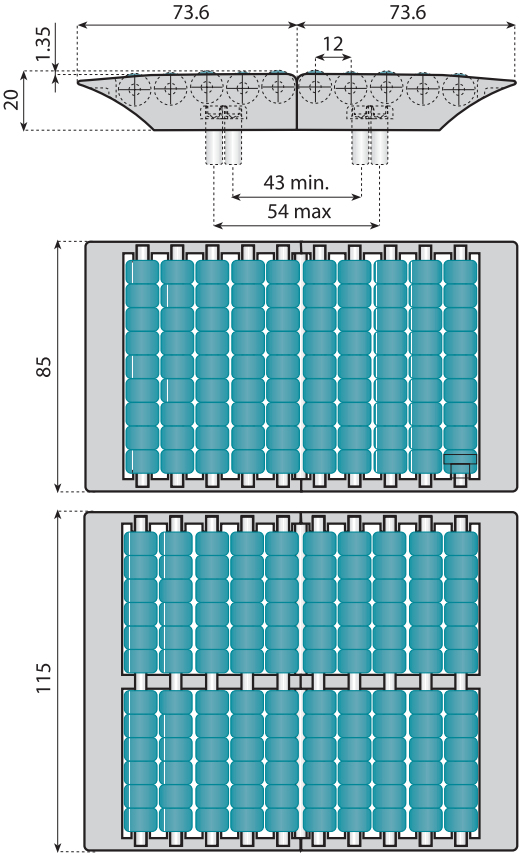
Assembly with two modules of three rows of rollers



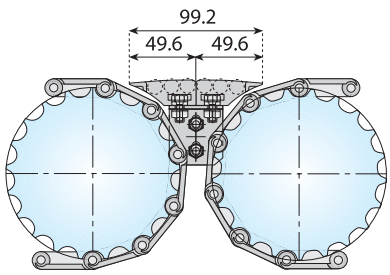
Assembly with two modules:
- One module with three rows of rollers
- One module with five rows of rollers



Assembly with two modules of five rows of rollers

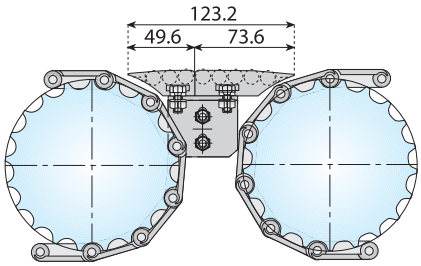


HEAD TO TAIL TRANSFER Examples of assembly



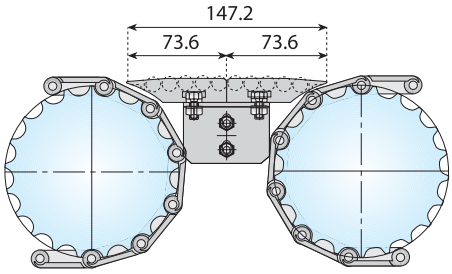
Head to tail transfer with two modules of three rows of rollers.

Assembly with stainless steel or plastic resin flat top chains. Top plate thickness from 3 mm to 4.8 mm



Head to tail transfer two with modules:
- One module of three rows of rollers
- One module of five rows of rollers

Assembly with stainless steel or plastic resin flat top chains. Top plate thickness from 3 mm to 4.8 mm



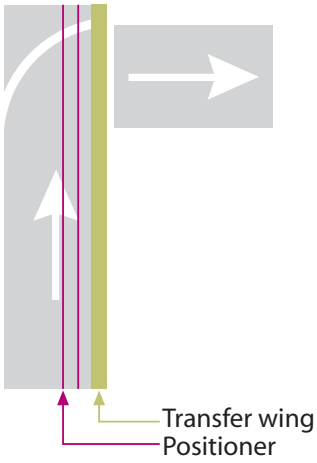
Head to tail transfer with two modules of five rows of rollers.

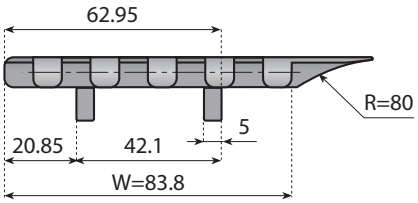
Assembly with stainless steel or plastic resin flat top chains. Top plate thickness from 3 mm to 4.8 mm

BELT with Transfer Wing

For **rectangular transfer** our BELT Transfer Wing system is recommended.

Transfer Wing belts are available for all BELT series.



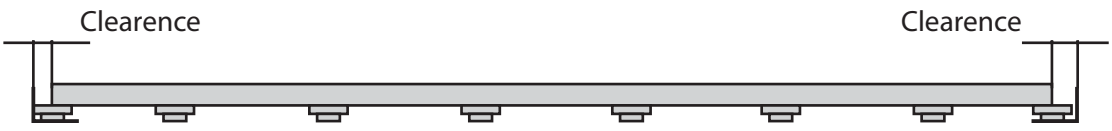


Example 2250 K330 (single track belt with 2 Positioners, suitable for standard chain guid rails)

Side guides for BELT

The clearance should be considered for a smooth run of the belt.

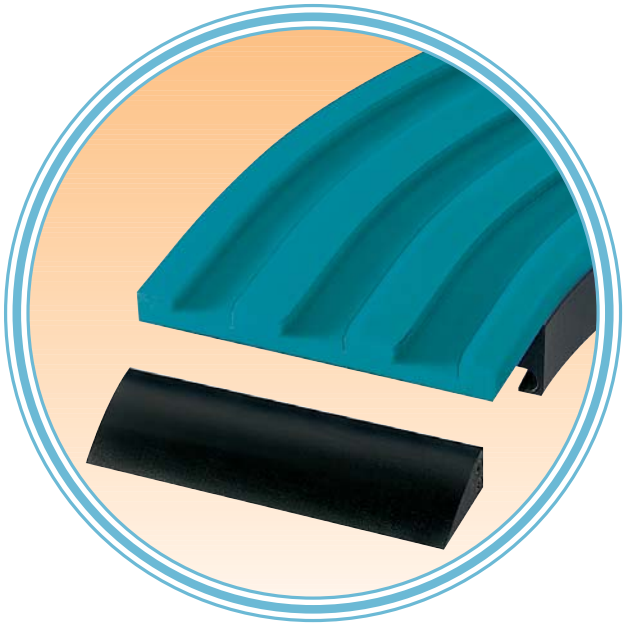
1 mm for belt width	< 500 mm
2	500 to 1500 mm
3	1500 to 3000 mm
4	> 3000 mm



Dual Magnetic Corner Tracks

CHARACTERISTIC

The Dual Magnetic System Curves are a new development, made under license, as per patented Magnetic Curve System.
The Dual Magnetic System Curves are used in conjunction with stainless steel or plastic chains.
The chains are retained in the system by the magnetic field created by the magnets that are located into the curve.
The Dual Magnetic System chains and curves,
compared to the older tab or bevel system, offer the user greater flexibility and improved efficiency as the design allows for easy removal of the chains from the curve - for cleaning and maintenance purposes.



ADVANTAGES

Steel and Plastic chains can be used in the same curves which means simpler conveyor construction, reduced inventories and ultimately lower costs.
Stainless Steel sideflexing magnetic retained chain has the same hinge width as the 815 series straight running chain and therefore uses the identical sprockets to the 815 series

Easier maintenance construction

Magnetic retained System chains to not incorporate the use of tab or bevel shoes which allows that the chain can be removed from the curve, without dismantaling the chain. Maintenance is therefore quicker and simpler which reduces downtime.

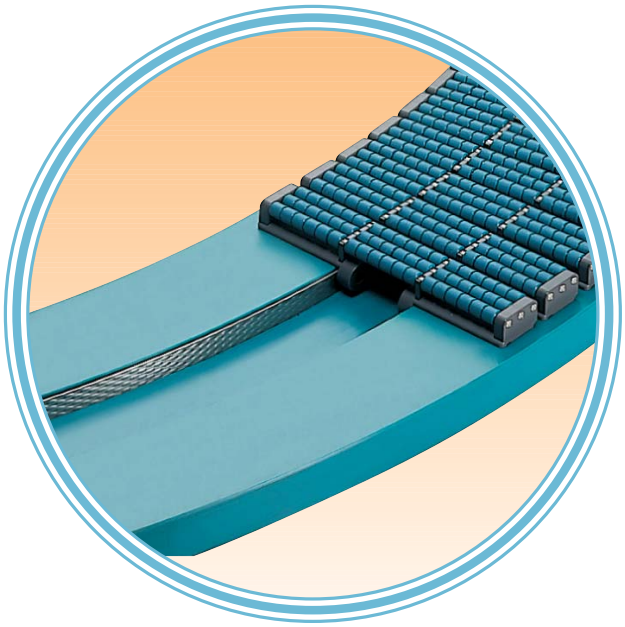
NEW MAGNETIC SYSTEM WITH METAL STRIP

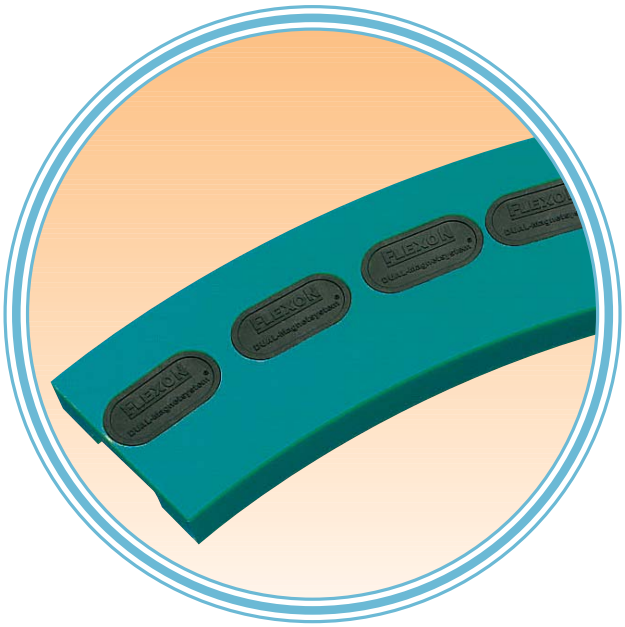
Flexon System Plast has recently developed a new magnetic corner retention system for dry-running applications.

The system, which is patent pending, sets new performance standards in magnet curve technology due to the inclusion of a unique metal strip mounted in the inside bearing face of the top section. This area is constantly under load due to the pressure/speed factor.

Main advantages:

- Extreme dissipation of heat significantly reduces wear.
- Under Test conditions lowest noise decibel levels were recorded.
- "Extra" curves are strongly recommended with plastic chains only!



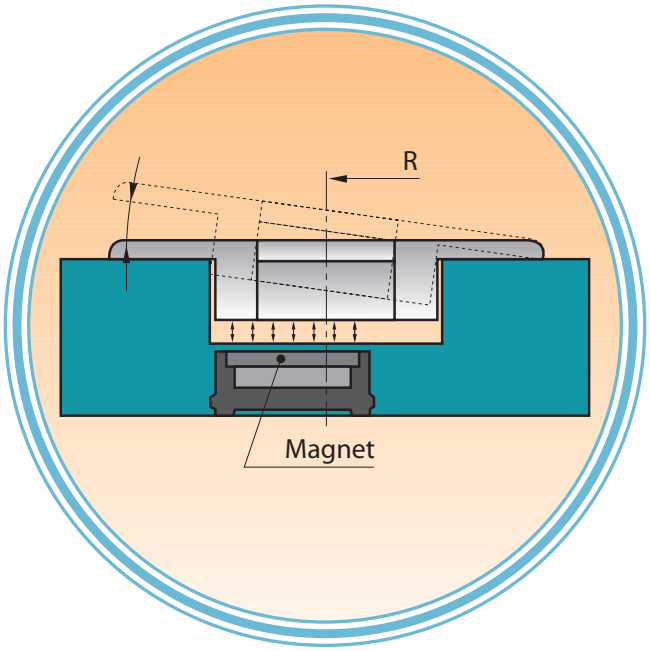


MATERIAL

The standard upper section of the Dual Magnetic System curve is produced from 1200 grade UHMW-PE (ultra high molecular weight polyethylene) with the molecular weight exceeding 7.3 million g/mol., which ensures optimum wear life.
The standard colour is waterblue, but is also available in different colours subject to minimum order quantity. The upper part of the Dual Magnetic System is available, on request, for special high speed or extremely abrasive applications.
The return track is available in standard regenerated 1000 grade UHMW-PE with a ultra high molecular polyethylene weight excending 4 million g/mol.
This ensures a cost saving advantage for the end - user, as the wear on the return track is normally less significant than the top section. Full materials are anhydroms which prevents curve swelling and distortion when exposed to water or moisture for lubrication purposes.

MAGNETIC PACKS

Flexon System Plast has developed special magnetic packs for the Dual Magnetic System curves.
These unique magnet holders are located into slots machined in the upper section of the curve.



DESIGN AND FUNCTIONALITY

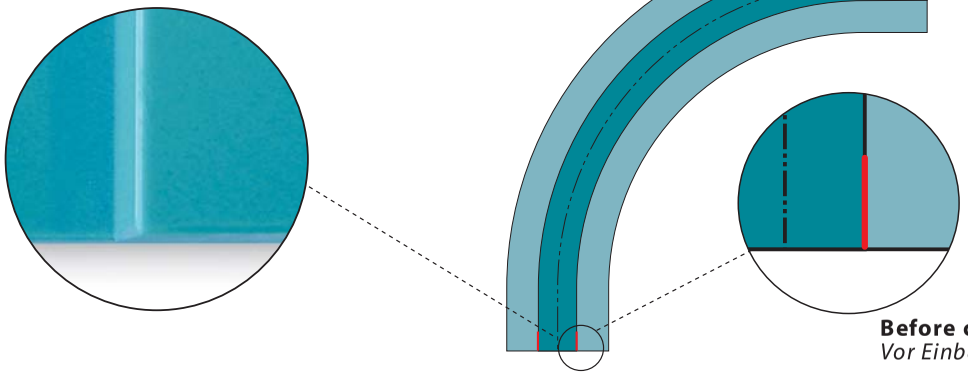
Dual Magnetic System curves have the magnets positioned on the outside of the centre line radius of each track which results in a more effective counteracting through the curve.
The positioning of the magnets in the Dual Magnetic System does not increase the chain load or friction, unlike other similar systems.

Installation advice
Einbauhinweise

Curve guide for slatband chains.

Kurvenführung für Scharnierbandketten

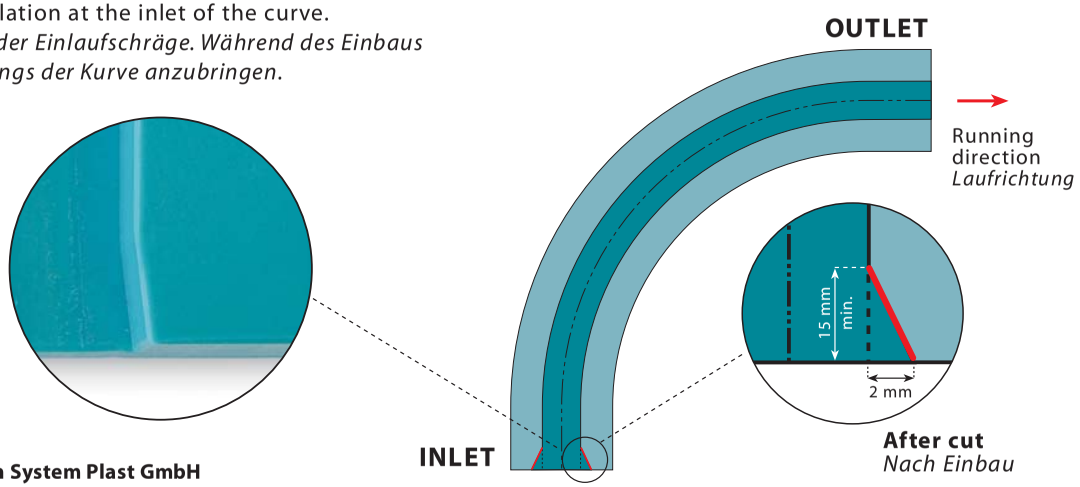
Supply scope of Flexon-System Plast curve:
Upper part without inlet funnel
Lieferumfang der Flexon-System Plast Kurvenführung: Oberteil ohne Einlaufschräge.



Before cut
Vor Einbau

IMPORTANT: After cut, side face should be square
WICHTIG: Die Einlaufschräge muss senkrecht zur Kurvenführung sein

Position of the inlet funnel. To be applied during installation at the inlet of the curve.
Lage der Einlaufschräge. Während des Einbaus eingangs der Kurve anzubringen.



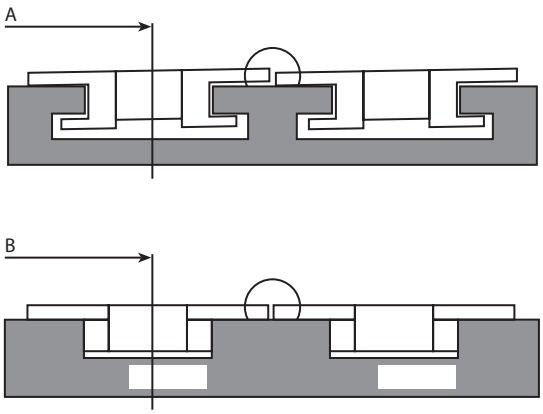
After cut
Nach Einbau

Flexon System Plast GmbH
Tel. (+49) 3529.56.15.0 - Fax (+49) 3529.51.13.67 - www.systemplast.com - info@fspchains.com

No matter which chain material is going to be used, whether it is stainless steel or plastic, the Dual Magnetic system is recommended.

The chains are held down in the curves by means of magnetic force instead of TABs or Bevels. This eliminates problems with chain tilting and thus eliminates height differences.

This is of vital importance when tottering bottles (e.g. PET) are to be avoided.



EXTRA Dual Magnetic Corner Track

Design:

- Stainless steel sheet metal insert is mounted to the inner side of the track.
- Surface of insert is structured in order to reduce friction between insert and chain.

Effect:

- Usually temperature increase in the contact area between chain and curve occurs proportionally to chain load and speed.
- As a result, the plastic material of chain and curve becomes more and more soft and abrasive wear takes place.
- The stainless steel insert removes the heat much better out of the system and friction is reduced significantly.

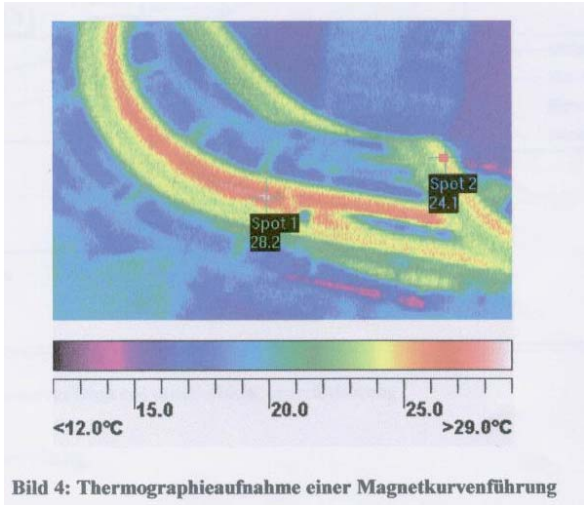


Bild 4: Thermographieaufnahme einer Magnetkurvenführung

Temperature increases towards the curve outfeed

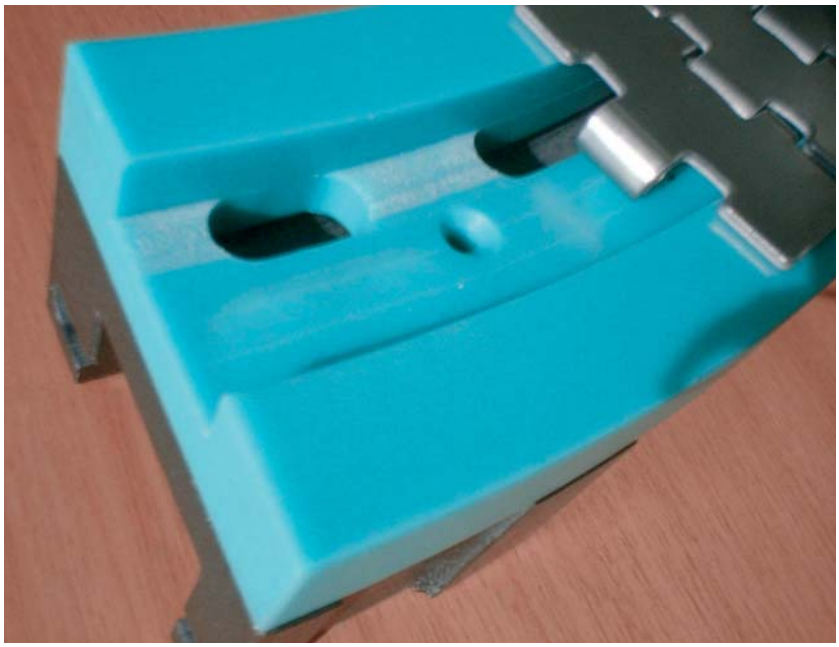
Applications:

- EXTRA curves are suitable for dry run applications with plastic chains.

Advantages:

- Wear at chain and temperature are reduced significantly.
- Wear at curve is reduced dramatically, almost zero.
- Noise level is reduced significantly.
- Chain load capacity is increased.

Self Cleaning (SC) Dual Magnetic Corner Track

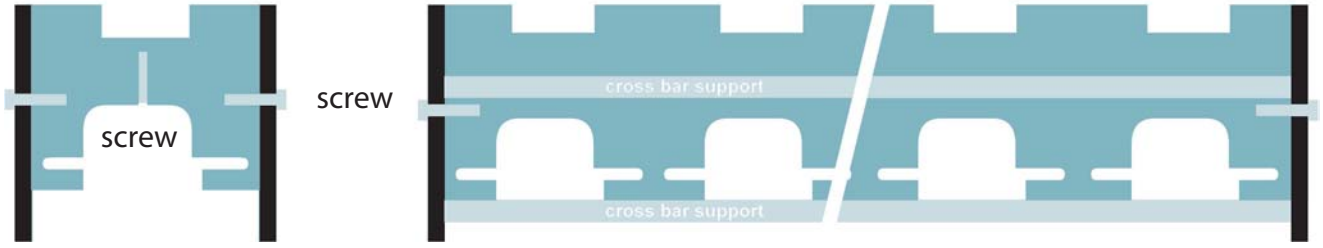


This curve, based on standard Magnetic Corner Tracks, is prepared for installation of cleaning nozzles.

Comparison of corner track holding systems

	Bevel	TAB	Magnetic
Chains hold firmly	Limited	Yes	Limited
Support in return part	No	Yes	No
Chains can be lifted for cleaning	Limited	No	Yes
Jamming of broken pieces	No	Yes	No

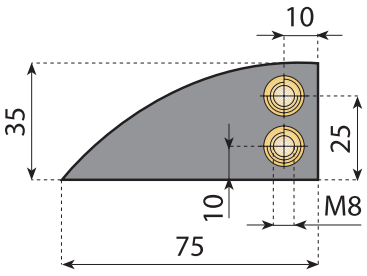
Installation



Single track

Multi track
Cross bar support is recommended
for curves wider than 6 tracks.

For trouble free infeed of chains, **Return Guide Shoes** are recommended, to be mounted to the infeed of the return part of the curve.

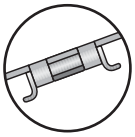


Always check returnpart for protruding bolts, that could obstruct the chain.

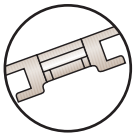
Corner tracks

For detailed information please refer to the Conveyor Chains Catalogue.

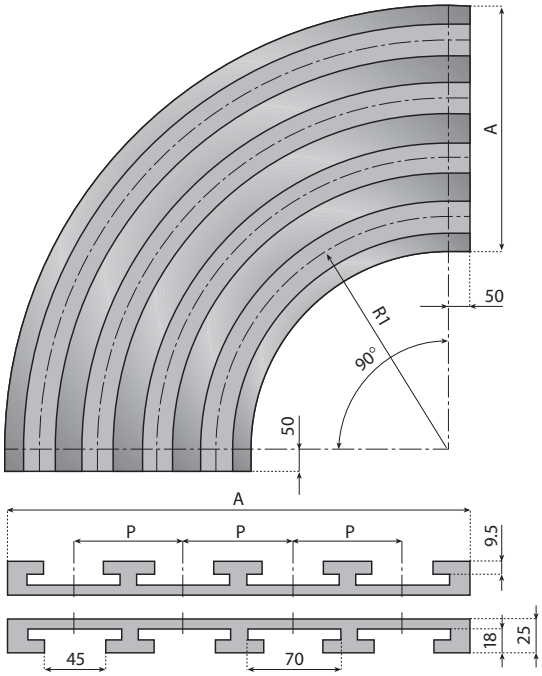
for TAB chains



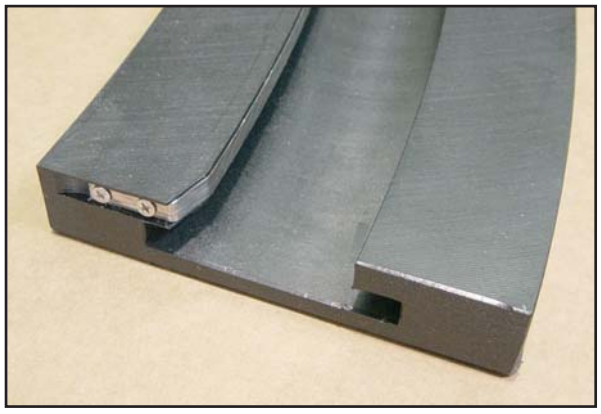
steel



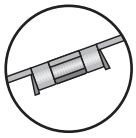
plastic



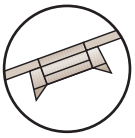
Example



for Bevel chains

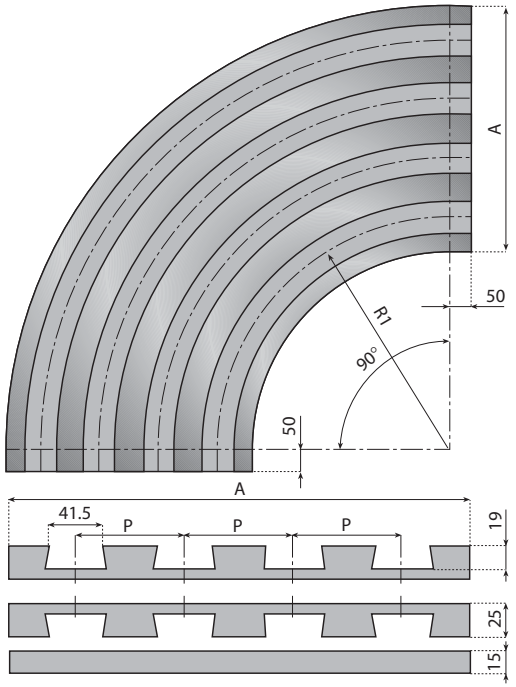


steel

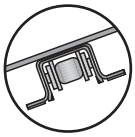


plastic

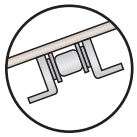
Example



for chains with roller chain

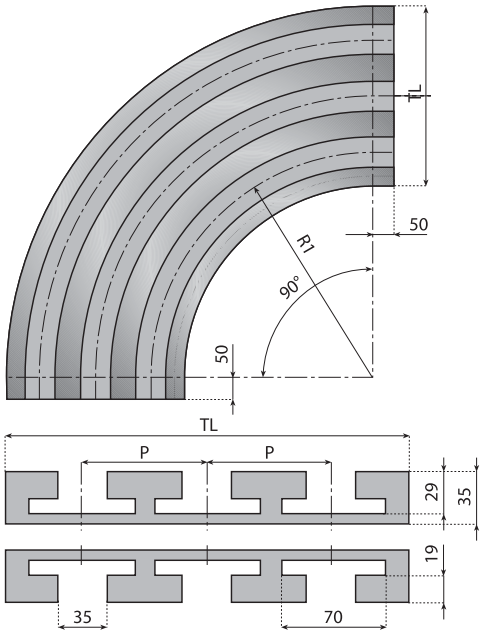


steel



plastic

Example



for LBP chains and

for Multiflex chains and

for CC chains

Please refer to detailed information and technical data in the Conveyor Chains catalogue.

Installation

Installation guidelines are similar to Magnetic Corner Tracks.

Usually Return Guide Shoes are not required.

Straight Tracks

Are available as well.
Please refer to detailed information and technical data in the Conveyor Chains catalogue.
Installation guidelines are similar to Corner Tracks.

APPLICATIONS

Inclined and declined conveyors

Maximum angles

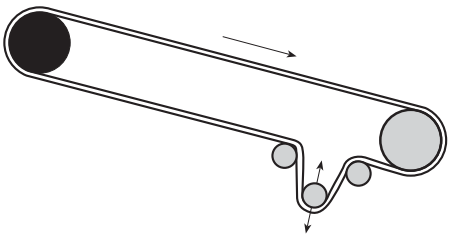
Chain type	lubricated	Dry
Stainless steel	4°	8°
Plastic chain/belt	2.5°	4.5°
High friction chains steel/plastic	12/15°	15/20°

*Dry run with steel chains is generally not recommendable

Pollution on the chain as well as on the product surface influences the maximum angles negatively.

Drive construction

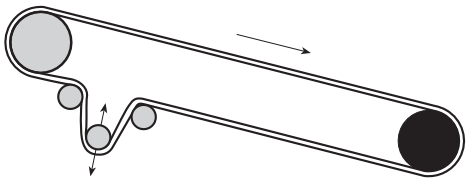
Declines



tan (critical angle) = coefficient of friction chain/belt against product, considering pollution

>8°

Soft start/stop is reccomended.

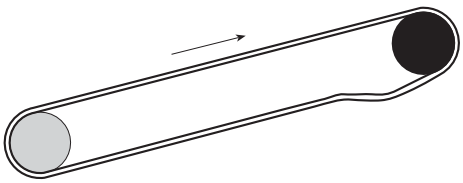


<8°

Soft start/stop is recommended.

Dynamic tensioner is in both cases recommended.

Inclines



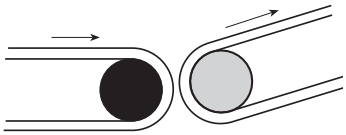
Drive is normally located at the upper end.

Soft start/stop is recommended.

Integrated transfer

Hold down guide, resp. TAB chain

separate transfer e.g. with dead plate



Curve construction in combination with inclines/declines

Sideflexing chains for Magnetic System can be used in inclined/declined conveyors only under the following restrictions:

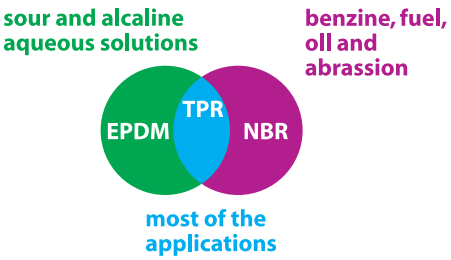
- Incline is possible before a curve
- Decline is possible after a curve

Otherwise the chain could be lifted out.

Example

Recommendation: install a separate drive for curving sections, that are located between inclined/declined sections.

High friction inserts of our chains have a Shore A hardness of 70+/-4.
Applicable temperature range –40 to +80°C.



Accumulation of products

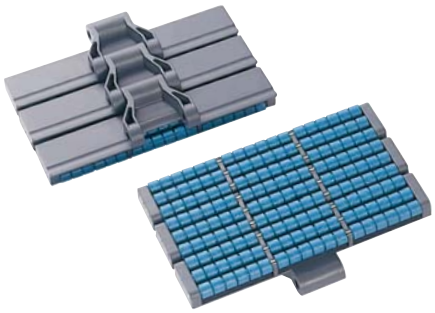
Accumulation of products results in increased load on the chain as well as in increased wear on chain/belt and product.

LBP (Low Back Pressure) chains/belts are recommended to avoid these effects.

With low noise accumulation rollers the friction and other negative resulting effects are reduced to a minimum.

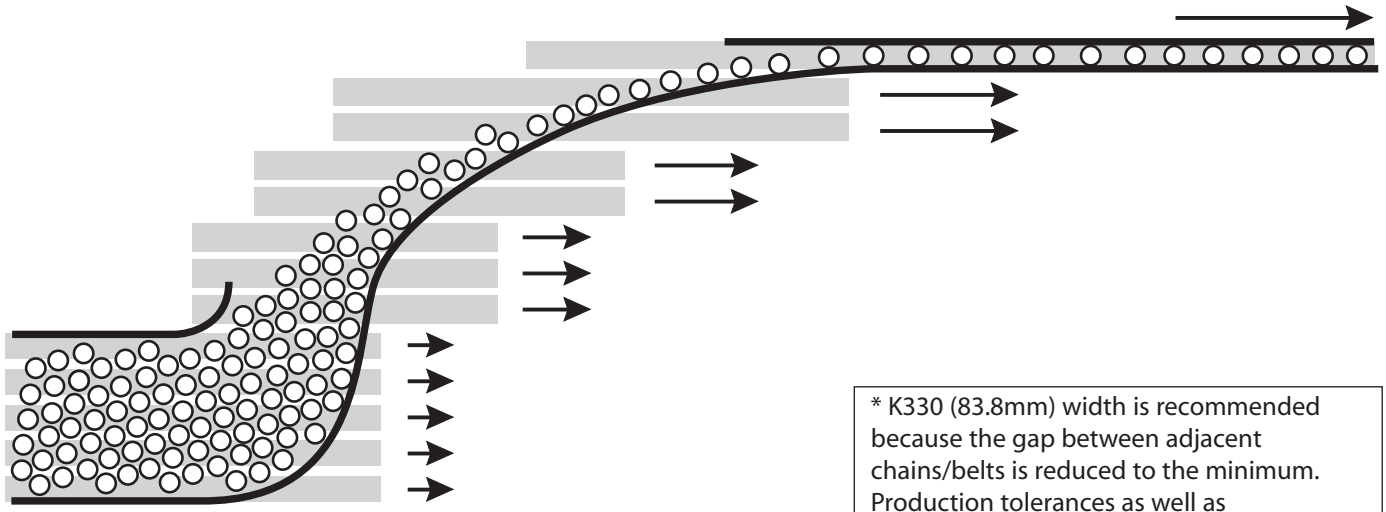
For the ***return part construction*** flat surfaces or guide shoes are recommended. Roller or serpentine wearstrips are not possible.

Frequent and thorough ***cleaning*** of LBP chains/belts is recommended to make sure that the accumulation rollers run free. Otherwise the advantages of this construction get lost.



Example

Pressureless combiner



* K330 (83.8mm) width is recommended because the gap between adjacent chains/belts is reduced to the minimum. Production tolerances as well as temperature elongation must be considered.
* K325 (82.5) width is necessary for sloped pressure less combiners.

Suitable chains/belts

Usually pressureless combiners have a track pitch of 85 mm.

Type		Characteristics	Suitable for
Stainless steel chains	* K330 ***SPEED-LINE***	Extremely close tolerances in terms of: Flatness, surface finish, no sharp edges.	Glass PET
Plastic chains	LF, XPG, NG * K330	Low friction.	PET Cans
Belts	2250 FT, FTP2 2250 FG, FGP2 2250 M FT 2250 M FG * K330	With Positioner. Closed or open surface. Low friction. Excellent stiffness. 1" pitch.	FG series: PET, Cans FT series: Glass, PET
	2251 FTP2 * K330 2252 FTP2 * K325	With Positioner. Closed surface. Heavy duty design. Low friction. Excellent stiffness. 1" pitch.	Glass PET Cans
	2120 FTP2 * K330 2121 FTP2 * K325	With Positioner. Closed surface. Low friction. Excellent stiffness. 1/2" pitch. Small transfer radius	Cans PET Glass

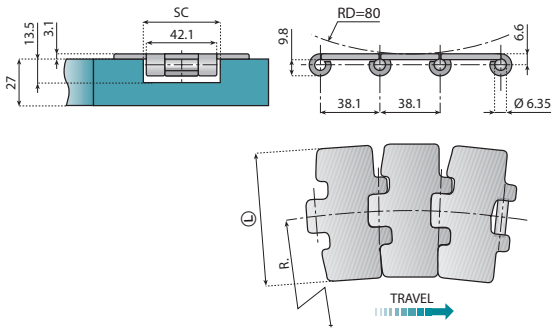
Optimised steel chains

For maximum product stability e.g. PET bottles, designer bottles and for critical applications e.g. inliners and pressureless combiners we offer the following chains.

For ***sideflexing applications:***

Stainless stell chains for Magnetic System:
SPC 881 MO
SPS 881 MO

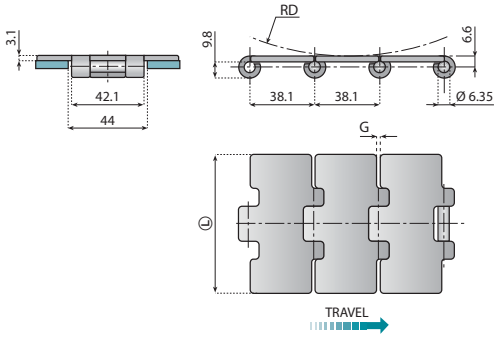
Design Features:
- ➢ Optimized plate in terms of
  - • Flat and smooth surface
  - o Defined convex shape of plate
  - • Maximum closed plate surface



For ***straight running applications:***

Standard stainless stell chains.

Our staight running stainless stell chains offer design features as mentioned above in standard execution.



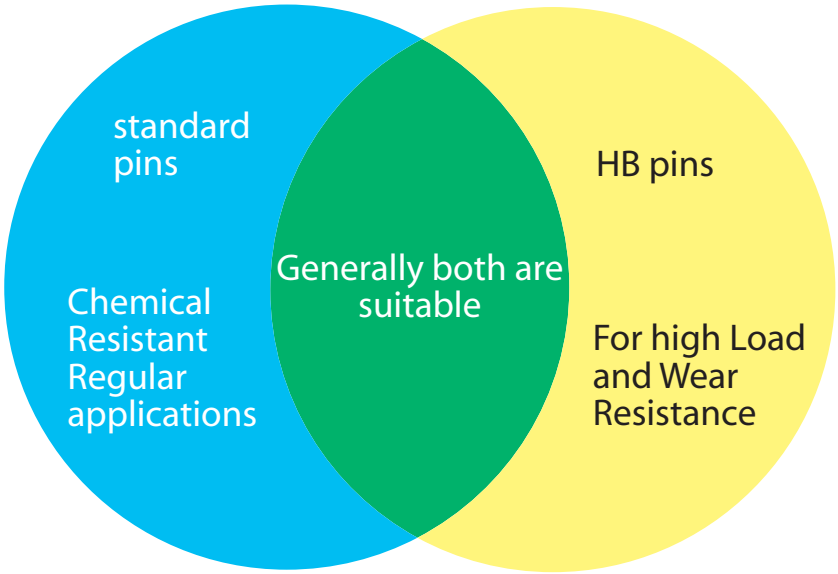
G (gap) = 1.5 mm minimum

For ***side transfer applications:***

Stainless stell chains as described above in K330 (83.8 mm) width for 85mm track distance.

The gap between adjacent tracks is reduced by approx. 50% (compared to K325 - 82.5 mm chains) to a minimum in order to avoid toppling products.

HB pins for extended wear life



- Clean environment / proper cleaning and lubrication
- Low speed and load
- Regular cleaning with aggressive chemicals

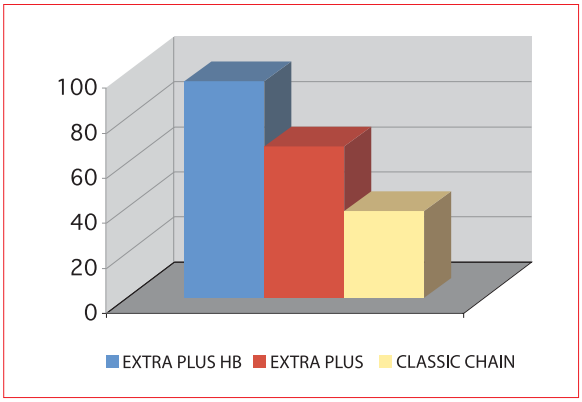
- Abrasive environment / dirt like crate conveyors / return bottles
- High speed and short conveyor like in filler area
- High speed and load
- Low speed , high load like in accumulation areas and full crate transport

Life time expectancy

Mass conveying

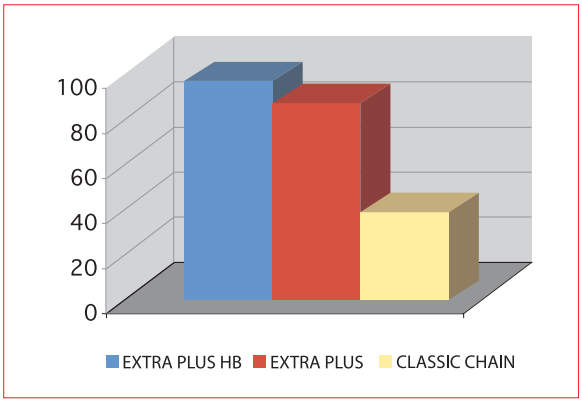
• High mechanical wear

EXTRA PLUS HB	100
EXTRA PLUS	70
Classic chains	40



• Chemical influence

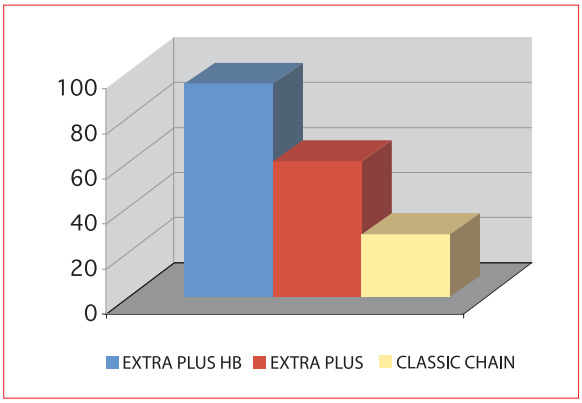
EXTRA PLUS HB	100
EXTRA PLUS	90
Classic chains	40



Pressureless inlining

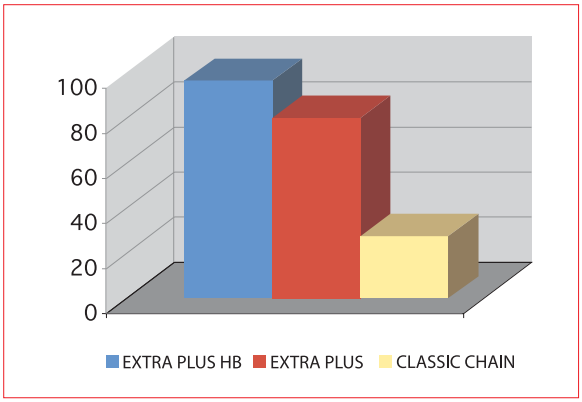
• High mechanical wear

EXTRA PLUS HB	100
EXTRA PLUS	60
Classic chains	30



• Chemical influence

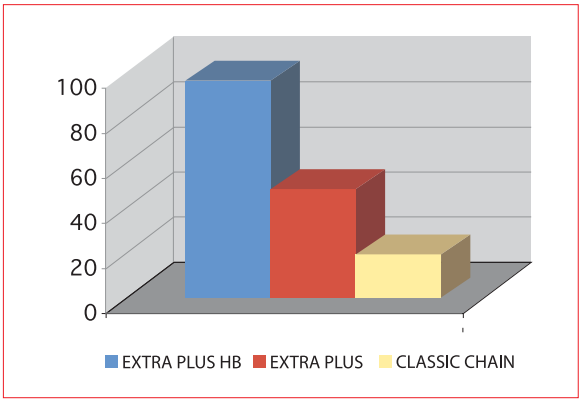
EXTRA PLUS HB	100
EXTRA PLUS	80
Classic chains	30



Have duty single line conveying

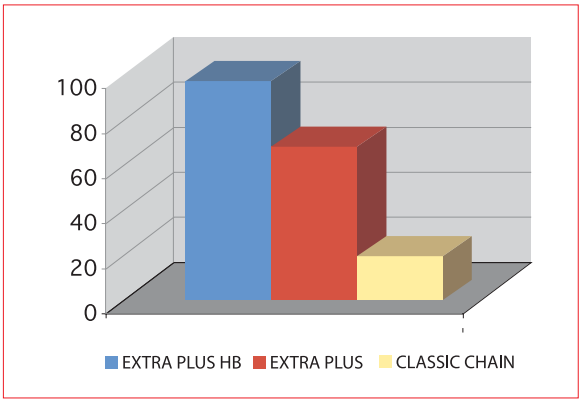
• High mechanical wear

EXTRA PLUS HB	100
EXTRA PLUS	50
Classic chains	20



• Chemical influence

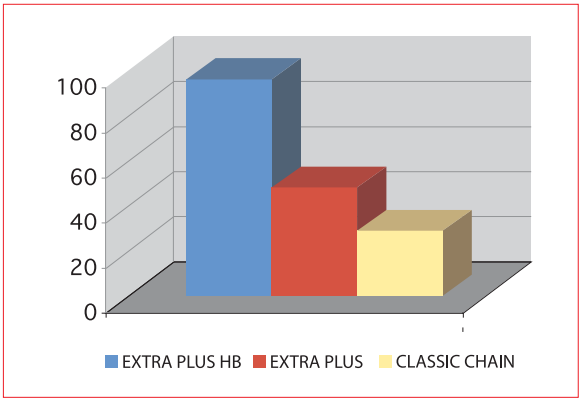
EXTRA PLUS HB	100
EXTRA PLUS	70
Classic chains	20



➢ *Life expectancy in case conveying*

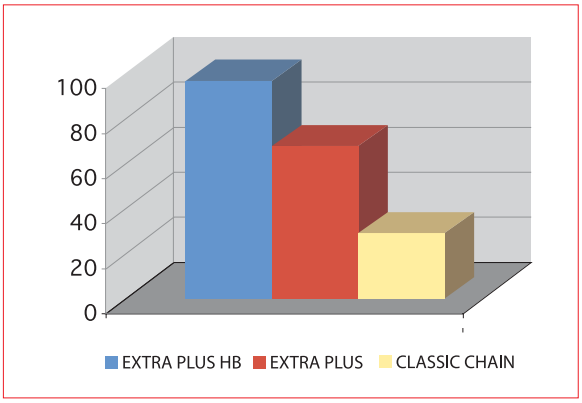
• High mechanical wear

EXTRA PLUS HB	100
EXTRA PLUS	50
Classic chains	30



• Chemical influence

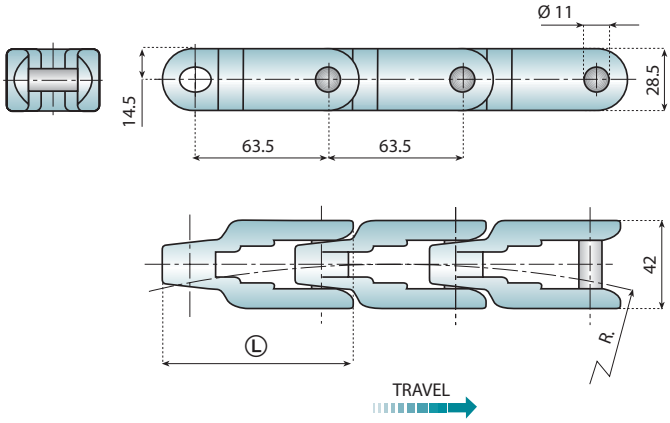
EXTRA PLUS HB	100
EXTRA PLUS	70
Classic chains	30



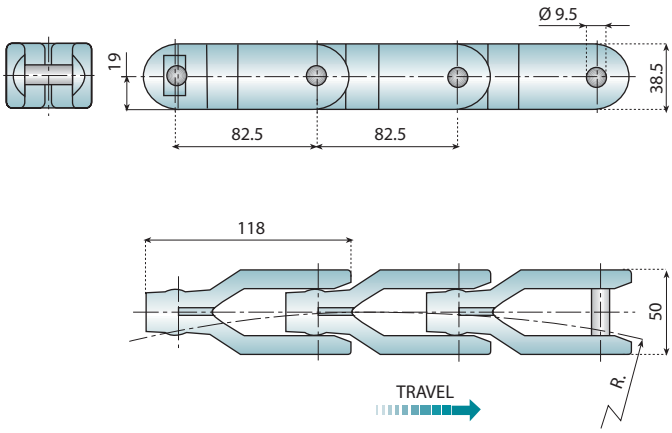
Crate conveying

Usually single track stainless steel chains 7 1/2 " wide are used for that purpose.
Two track 3 1/4 " stainless steel chains installation is also possible.

Special plastic chains are available for conveying of heavy crates, boxes and kegs especially in dirty environment under rough conditions.



CC600



CC1400

For straight sections ferritic stainless steel profiles with a surface finish of max. 1.6 µm and a hardness of 25 HRC are recommended.

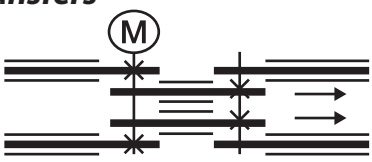
All edges should be chamfered.

To ensure proper operation and long wear life, the CC chain should not be tensioned in the return part.

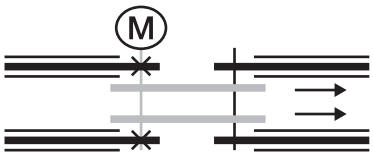
Lubrication is not recommended and in most cases not required anyway.

Curve constructions should enable easy removement of debris. Open design is recommended.
The chain should be removable out of the curve for cleaning purposes.
Inside guides can be made of plastic, however, stainless steel is recommended to avoid imbedding of dirt in the guides, that would reduce the wear life of the chain.

Transfers



Slave drive



dead plate

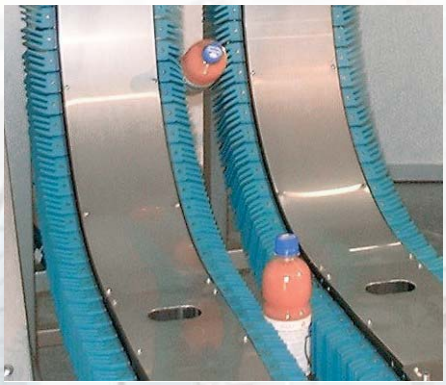
staggered conveyors

Gripper chains applications

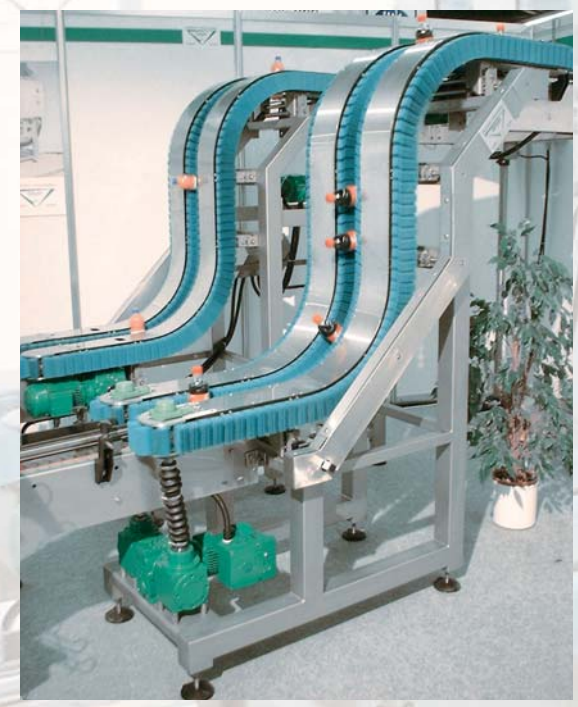
General instruction / recommendations

- Chains tracks must parallel before installing the chains.
  The tolerance for the parallel adjustment of the tracks is <2mm.
  Incorrect adjustment can lead to overloading and rapid wear.
- It is very important to regard the orientation of the gripper ribs.
  They must be bent backwards relative to the running direction of the chain.
- The control system of the conveyor must assure that no backline pressure is created.
  Backline pressure damages gripper chains.
- The clearance between the chain tracks must be adjustable.
  The gripping forces must be adjustment according to the product:
  general rule: as tight as the product can still be removed manually.
  This is usually 5 to 10 mm less than the product width / diameter.
  It must be avoied that grippers touch each other e.g. by too tight adjustment.
  Touching grippers loose their elasticity what can result in damage as weel as production stand still.
- A tensioning system is strongly recommended.
  Overstressing the chain by too strong tension must be avoided.
- It is of major importance to avoid touching products.
  If products touch each other while being clamped by the gripper chains, they cause damage.
  It is e.g. recommended to set the speed of the feeding conveyor a little slower than the speed of the gripper conveyor.This ensures a gap between the products, which is necessary.
- Summary of recommendations:
  - Continuous operations, no start / stop
  - Run the gripper elevator empty before a line stop
  - Use frequency controlled drivers with soft start / stops
  - If lubrication is necessary, PermaLub devices are preferred, grease lubrication is not recommended because the grease binds dirt and creates wear.
  - Continuous inspection is strongly recommended
  - Avoid:
  - Too tight adjustment of the tracks
  - Misaligned tracks and / or sprockets / wheels
  - Touching products
  - Collision points with parts of the conveyor construction.

Orientation of gripper ribs



Elevator



Crate turner

Gripper chain assembly instruction

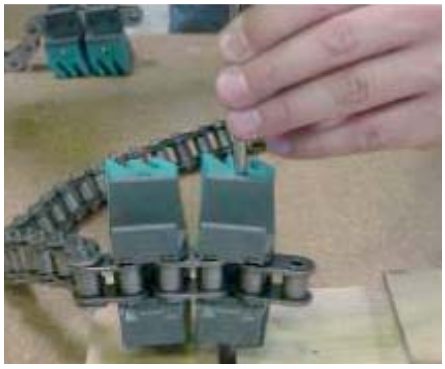
SIDEFLEXING PLASTIC PLATE TOP CHAINS WITH GRIPPERN SNAP ON

(BASE ROLLER CHAIN 19.05 mm - $^{3}/_{4}$ inch - pich - side bow type)
Instruction for the assembling/disassembling of the plate and the rubber
(GSI - for light applications,GS2 - for heavy applications,GS3 - for special applications

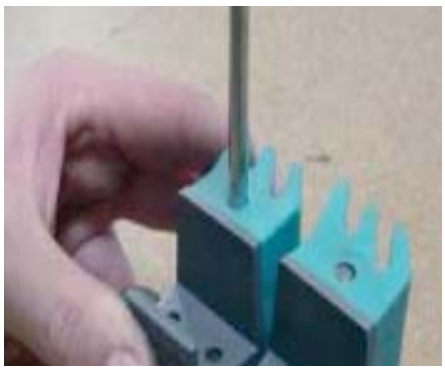
Picture 1:Connecting of two assembled chains with a connecting link

Picture 2:Assembling of the plastic plate.
Step 1:heat to about 70° centigrade heating treatment time:20 sec

Picture 3:Assembling of the plastic plate
Step 2:Assembling in the show way



Picture 4:Disassembling of the rubber
Attention! push out the pin in direction **OUT**



Picture 5:Assambling of the rubber
Attention!assemble the pin in direction **IN**

Picture 6:Cut the chain in the wished leght
Attention!use a compact base

Lubrication: You have to check the lubricationof the roller chain at regular intervals!

PRODUCT HANDLING

Conveyor length

Conveyor length depends on
- Chain/belt type
- Lubrication
- Product
- Load
- Etc.

Type	Max. advisable length [m]
Stainless steel, straight	Approx. 15
Stainless steel, sideflexing	Approx. 12
Plastic chains, straight	Approx. 9-12
Plastic chains, sideflexing	Approx. 9-12

Only valid for standard conditions.

For long conveyors it is recommended to place curves close to the idler end in order to reduce chain load resulting in longer wear life.

A phenomenon, called **slip stick effect** occurs unpredictably. It depends on speed, load, construction and lubrication. Pulsating dynamic forces are the result and affect the service life of all components of a conveyor. Long conveyors should be avoided in such cases.

Long conveyors result in high chain load, which affects all components of the conveyor and reduces their wear life.

Conveyor speed

Maximum m/min

Type	Lubrication		
	Dry	Water	Water & soap
Stainless steel, straight	50	70	130
Stainless steel, Magnet System	30	40	130
Plastic chains, straight	80	100	180
Plastic chains, sideflexing, Magnet System	50	90	180
Plastic belts, straight	80	100	180

Under abrasive conditions the maximum speed is reduced.

STM Safe Transfer Module

STModule

Safe Transfer Module

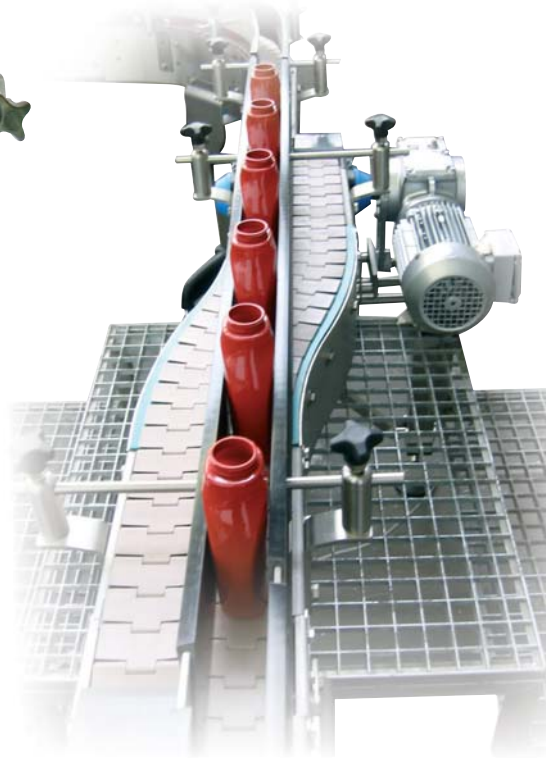
Features

- Safe and smooth Transfer of instable products
- Compact design, one solid piece, no edges
- Easy installation

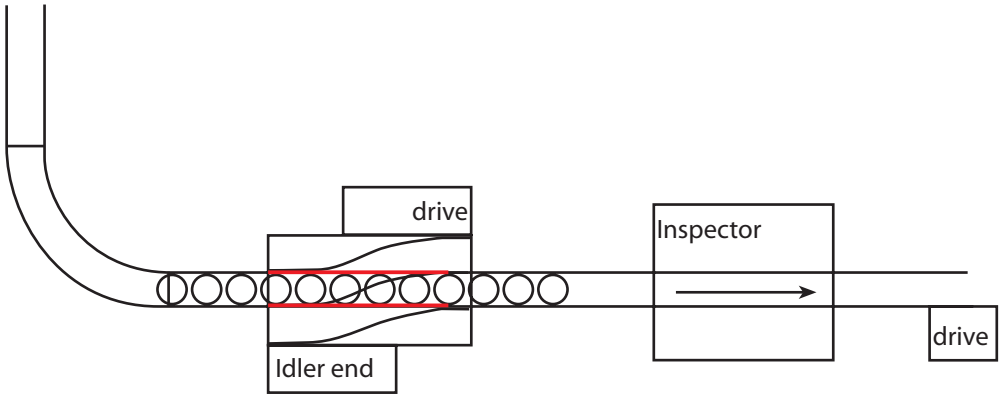
Sicherer Transfer Modul

Merkmale

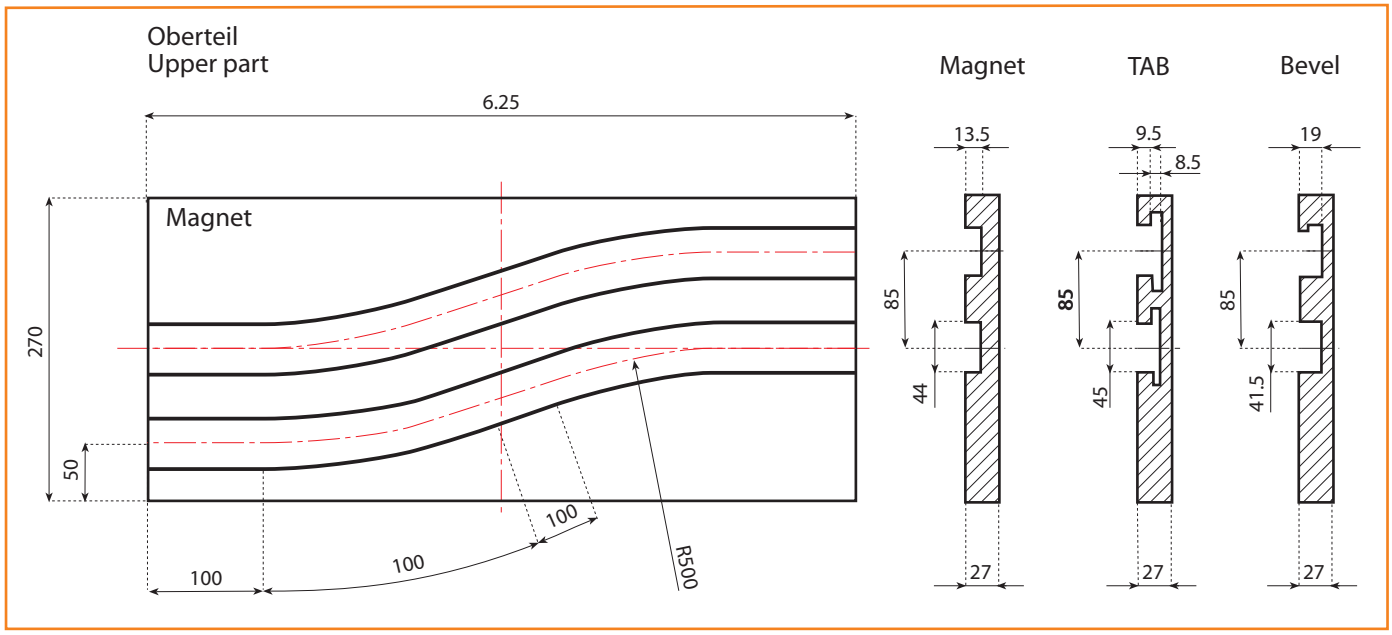
- Sicherer und sanfter Transfer instabiler Produkte
- Kompakte Ausführung einteilig, keine Kanten / Übergänge
- Einfache Installation

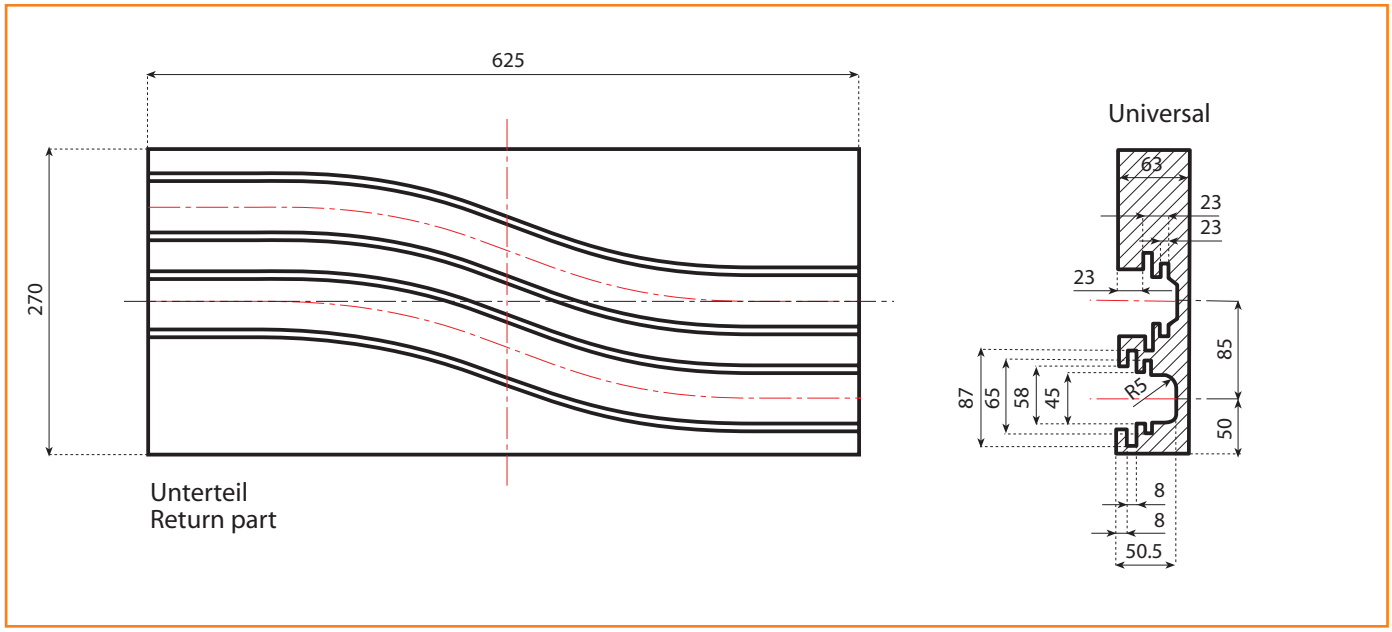


Application Example Anwendungs-Beispiel



Construction Konstruktion





Static electricity

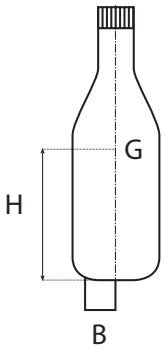
AS material has the following properties:		Surface resistivity:	10^5 Ohm
According to IEC60093 test method		Volume resistivity:	10^5 Ohm m

General instructions / recommendations:

- Caution!
- Already during transportation of the chains electric charge can be generated what can cause sparks.
- Before carrying the chains into an explosion hazardous area any electric charge must be dissipated from the chain.
- Disharging can be done for example by brushing the chains with a grounded and conductive wire brush.
- The chains must be grounded, respectively included in the potentialequalisation of the plant.
- It must be assured on site that the electric charge is dissipeted to the ground preventing any damage.
- Grounding of the chains can be achieved by appropriate wear strips and by appropriate sprockets and idler wheels.
- By means of conductive and grounded wire brushes electric charge can be removed directly from the surface of the chains.
- Wear strips must be conductive and grounded.
- Damage at chains (wear) caused by wear strips must not exceed the admissible limits.
- Caution!
  Wear at chains must not lead to lay open the metallic pin which might scratch over other metallic surfaces and generate sparks.
- Sliding properties of wear strips must admit save operation of the chains.
- Chain breakages must be avoided.
- Caution!
  Chains breakages can cause impact sparks.
- Construction, layout and control system of the conveyors must permit a save operation of the chains.
- The chain speed must not exeed 1 m/s.
- Sprockets and idler wheels must be conductive and grounded.
- In case a system of rollers is used for the return of chain the same is applicable for the return rollers as for sprockets and idler wheels. (see 16)
- The resistance of the grounding must not exeed 1MOhm (=10^6Ohm = 1000000Ohm).
- The resistance of the grounding must be checked by the assembly fitters prior to installing the chains.
- During assembly / installation of the chains sparks must be avoied.
- Appropriate tools must be used.
- Chain pin must be installed completely and carefully.
- After the chais pin installation the chain links must be checked and in case of any damage be replaced.
- Swarf and any other metallic or sparking objects must be removed from the conveyor prior to start -up.
- The total chain length of a grounding section must not exceed 333 chain links.

Product stability

A product stands stabile even in case of large speed variation if C > R.
Critical coefficient C=B/H.
Real coefficient R=real friction coefficient, measured for the application in question.
Raised edges however have to be avoided.



With the following formula the maximum admissible speed variation can be calculated:

Max. admis. speed variation MSV* = SQR(2*g*SQR(H^2+B^2)-H)
SQR = square root
g = gavitational acceleration
H = height of centre gravity
B = base radius
G = centre of gravity

*MSV indicates e.g. the max. admissible speed of a bottle being conveyed onto a dead plate without tilting

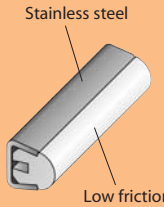
Noise reduction

Measures:

- Use curves instead of dead plate transfer.
- Install flow control devices like frequency controlled drives to adjust the conveyor speed according to actual requirements (e.g. accumulation stop).
- Cover guiderails with plastics.
- Use plastic sprockets and idlers.
- Use plastic wearstrips in combination with steel chains.
- Use return part rollers with a larger diameter than 60 mm.
- Apply lubrication.
- Use Magnetic Corner Tracks in EXTRA execution with profiled stainless steel sheet metal insert or Nolu-S material.

Product guides

The conical guide rail incorporates two outstanding materials: stainless steel and UHMW. The stainless steel sheath provides rigid streamlined support for heavy loads at any speed, plus a solid connecting point for holding the rail in place with clamps and brackets. The UHMW guiding surface is available in a wide selection of shapes. The very low friction characteristics of UHMW allow containers to move at high speed with a minimum of drag, container damage, and noise. Materials are approved by the FDA and accepted for use in USDA inspected facilities.



METAL PROFILE

Metal profile is typically in stainless steel AISI 304 (AISI 316 on the request), used for its excellent resistance to corrosion and long lasting attractive appearance. Galvanized steel can be ordered as an economical alternative to stainless steel.

Zn
Zinc plated steel

SS 304
304 Stainless steel

STANDARD VERSION

Natural UHMW *- The manufacturing process allows the use of UHMW without additives or other processing chemicals. The result is a material that resists abrasion better, is more color stable (less prone to yellowing) and of uniform consistency. Available in two colors black and white.*

PE
Polyethylene
UHMW

SELF LUBRICATED VERSION

Nolu-S UHMW *- Battleship grey color. A lubricant system is added to our standard UHMW during processing to give it reduced friction while maintaining all other physical properties. The coefficient of friction Nolu-S material is ca 35% lower as standard. The PV-limit for chain is at least 2 times the standard value for UHMW.*

NOLU S
Polyethylene
Nolu-S
UHMW

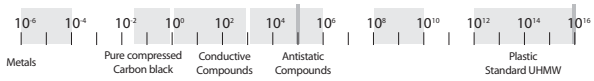
VERSION WITH IMPROVED ELECTROSTATIC CONDUCTIVITY

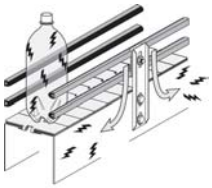
Static Dissipating UHMW *- Special formulation retains the low friction and wear characteristics of UHMW while effectively reducing problems caused by static. Color: black.*

PE as
Polyethylene
UHMW
Antistatic

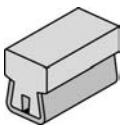
Antistatic Polythylene

Specific electrical resistance (Ohm x cm)


10⁻⁶ 10⁻⁴ 10⁻² 10⁰ 10² 10⁴ 10⁶ 10⁸ 10¹⁰ 10¹² 10¹⁴ 10¹⁶
Metals
Pure compressed Carbon black
Conductive Compounds
Antistatic Compounds
Plastic Standard UHMW



Static dissipative UHMW rail provides a conductive pathway to disperse the buildup of static electricity.

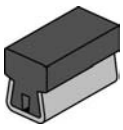


VERSION FOR HIGH TEMPERATURE

High temperature. Special developed material to operate under high temperatures. The HT profiles are designed to operate under a continuous temperature of maximum 270°C. Typical applications for HT profiles are: Ovens, cookers, hot fill area, steam chambers, furnace discharge, retorts, fryers, shrink tunnels, pasturizers and steam boxes.

For use in high temperatures

SPECIFICATIONS	HI-TEMP MATERIAL	MATERIAL PROFILE
Tensile Strength - ASTM D-1457 (N/mm²)	12.6	500
Deformation under load - ASTM D-621 (%)	3.8	-
Coefficient of thermal expansion - ASTM D-696 mm/mm/°Cx10⁻⁵)	7.47 (37°-120°C) 12.62 (120°-150°C) 7.47 (150°-270°C)	-
Coefficient of friction - ASTM D-1894	0.04	-
Continuous service temperature	270°C	-



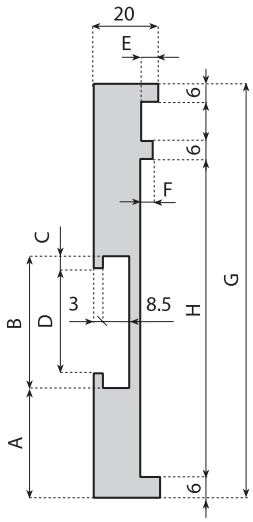
VERSION WITH NYLATRON INSERT

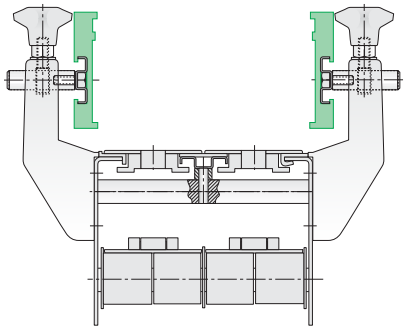
For applications such as high conveyor speeds, heavy loads or abrasive conditions. Nylatron can be used at continuous temperatures up to 93°C.

Ny
Nylatron

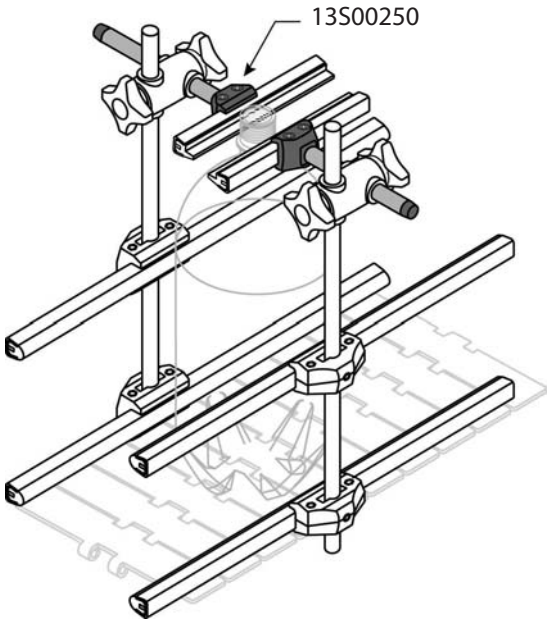
Special product guides for labelled bottles avoiding scratches

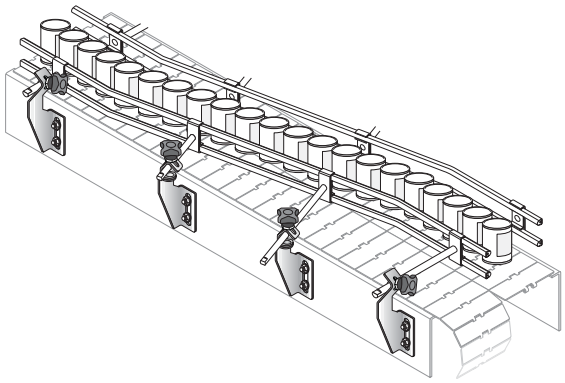
SIDE GUIDE FOR LABELLING BOTTLE

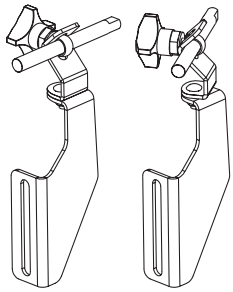




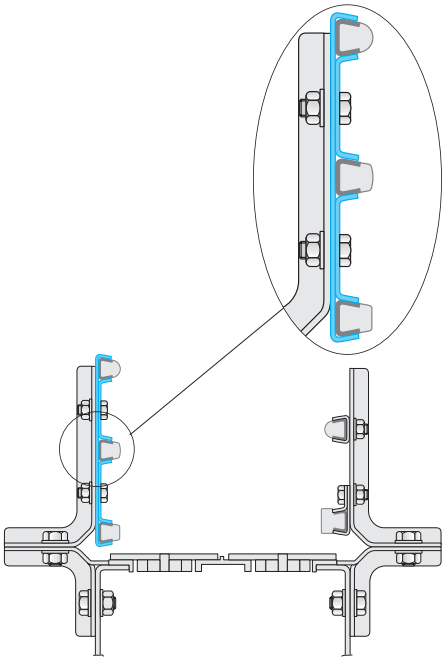
Installation example



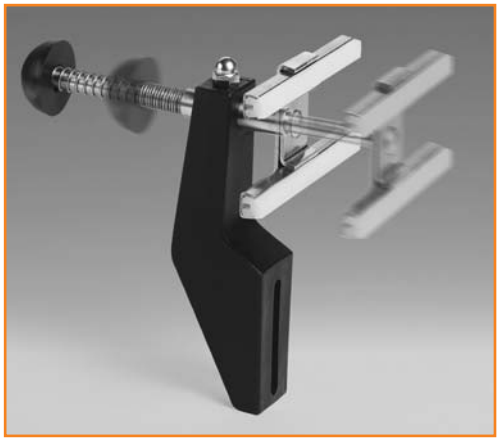




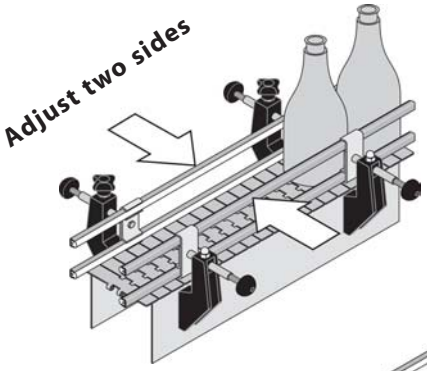
Heavy duty

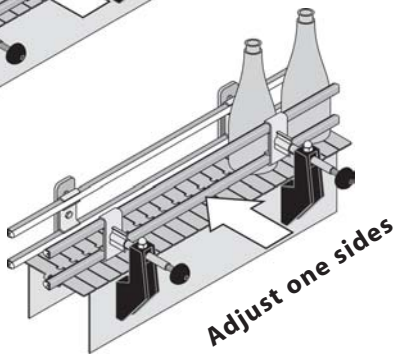


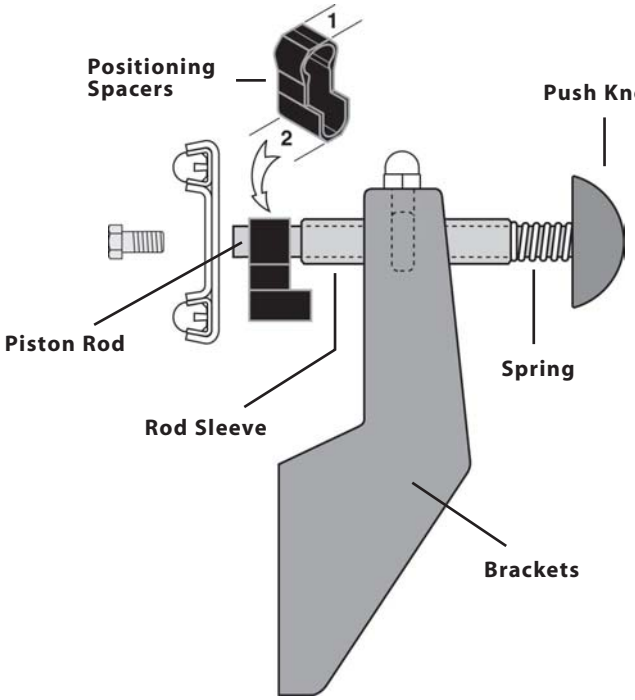
Speed set

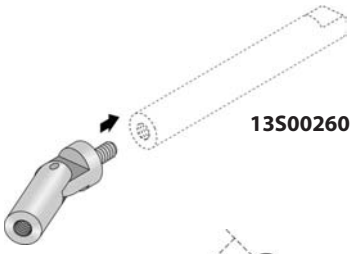


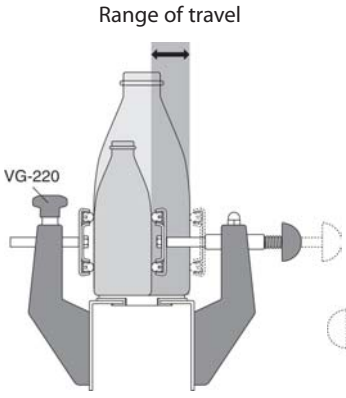
Adjusts to 3 container sizes! SpeedSet™ brackets offer preset conveyor guide rail adjustability that is fast accurate without the need for tools. A simple push on the end knob moves the pin, clamp and guide rail. Spacing blocks, cut the length needed, accurately hold the pin and guide rail in position.



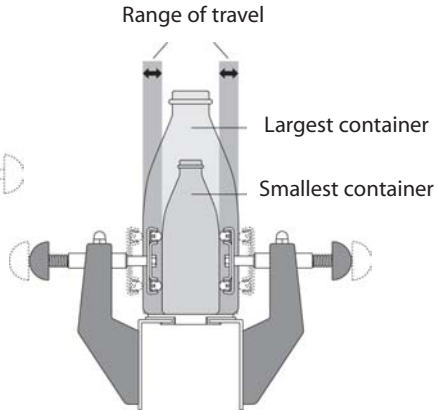




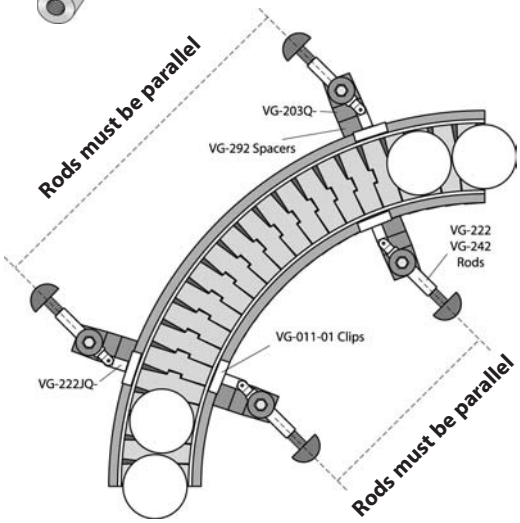




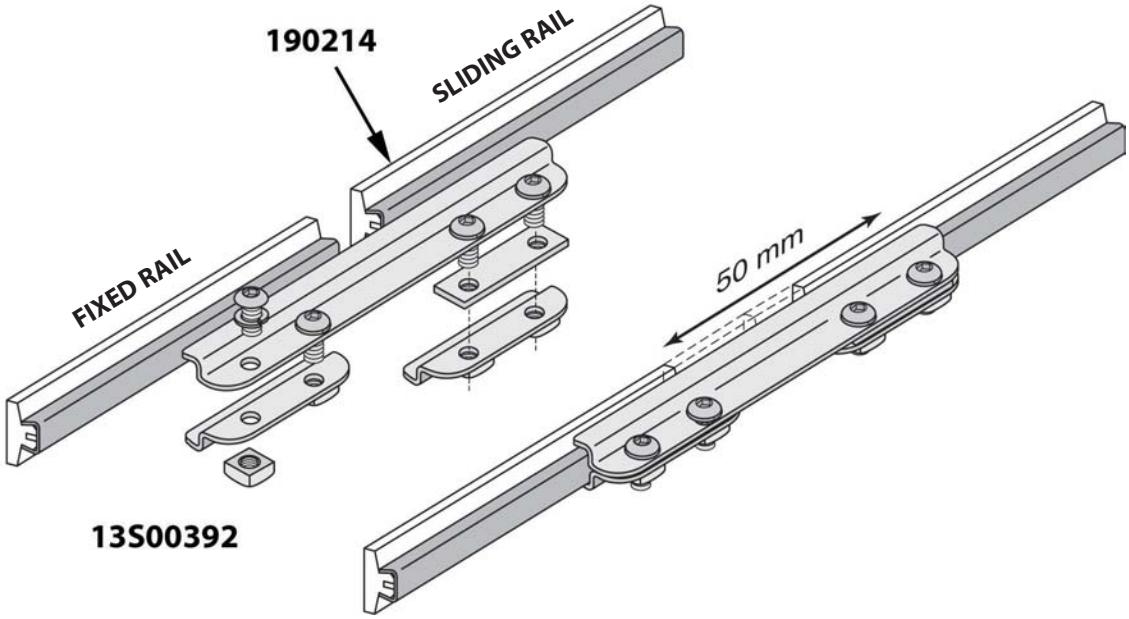
Single side adjusting



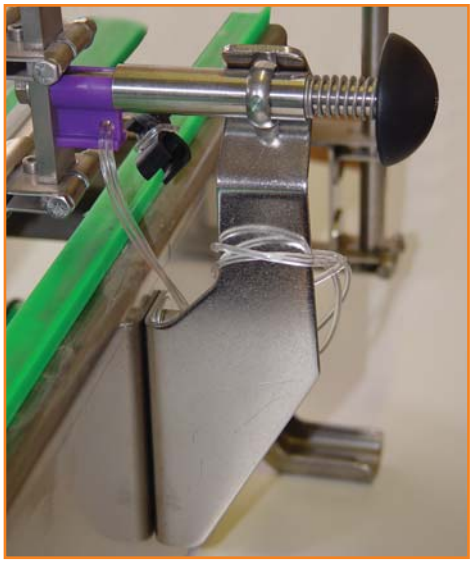
Double side adjusting



Adjustable splicing clamp
Required for adjustable curve product guides



SpeedSet



Side guides for creates

Roller side guides are recommended for shrink packs and carton packs

They avoid scratches and other damage at the packs and at the same time they reduce backline pressure

CALCULATION

Required data for chain calculation

Chain and material specification		
Chain type		
Curve material		
Material straight upper part		
Material straight return part		
Product material		
Product details and conveyor specification		
Products/hour		
Product weight	[g]	
Chain speed	[m/min]	
Lubrication		
Number of tracks		
Sprocket size	[teeth]	
Diameter product	[mm]	
Height difference	[mm]	
Power consumption	[Watt]	

Conveyor layout from idler to drive					
Section	**Length**	**Angle**	**Radius**	**Accumulation**	**Occupation**
	[mm]	[°]	[mm]	[%]	[%]
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Required operation data
Please add a sketch of the conveyor layout.
Please describe operation conditions (e.g. abrasive conditions, environmental conditions, special operation requirements) in detail.
Please describe product features in detail, add drawings/sketches.

Replacement of chain/belts
Which chain/belt was used before?
Did it work satisfactory or did problems occur?

→ SysCalc

Please contact your Flexon System Plast partner or our technical support department.

Required data for belt calculation

Belt and material specification		
Belt type		
Belt width	[mm]	
Material straight upper part		
Material straight return part		
Product material		
Product details and conveyor specification		
Products/hour		
Product weight	[g]	
Belt speed	[m/min]	
Lubrication		
Sprocket size	[teeth]	
Diameter product	[mm]	
Height difference	[mm]	
Power consumption	[Watt]	
Centre drive	[yes/no]	

Section	Length	Accumulation	Occupation	Temperature
	[mm]	[%]	[%]	[°C]
1				
2				
3				
4				
5				

Required operation data
Please add a sketch of the conveyor layout.
Please describe operation conditions (e.g. abrasive conditions, environmental conditions, special operation requirements) in detail.
Please describe product features in detail, add drawings/sketches.

Replacement of chain/belts
Which chain/belt was used before?
Did it work satisfactory or did problems occur?

Please contact your Flexon System Plast partner or our technical support department.

→ SysCalc

Conveyor calculation

If you do not have our calculation programme installed, the following calculation guide will help you to design/calculate your conveyor.

Chain pull calculation – straight running conveyors

$$T = 9{,}81 \bullet \{[(M + 2W) \bullet C_H \bullet K_1] + [M_a \bullet L_a \bullet (K_2 + K_1) - M \bullet L_a \bullet K_1] + (M \bullet C_V)\}$$

(1) (2) (3)

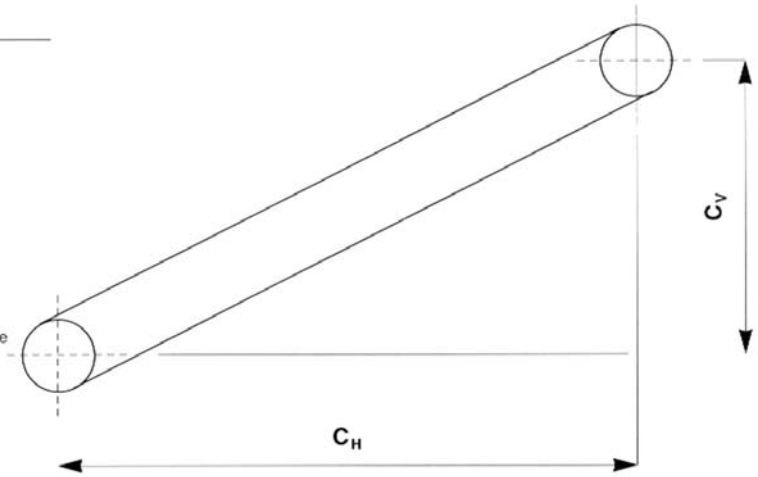
This formula applies to straight running, inclined straight running and straight running with an accumulation section.

If the conveyor is not inclined, part "3" of the formula will be equal to zero.

If the conveyor does not have the accumulation section, part "2" of the formula will be equal to zero.

The used symbols are:

- T = chain pull at the sprocket in Newtons
- M = conveyed product weight (kilograms per metre of chain)
- W = chain weight (kilograms per metre)
- C_H = horizontal length of the conveyor running (metres)
- C_v = vertical height of the conveyor running (metres)
- K_1 = coefficient of friction between chain flights and wear strips
- L_a = length in metres of the accumulating section on the conveyor
- M_a = accumulated product weight (kilograms per metre)
- K_2 = coefficient of friction between chain flights and accumulated product



Chain pull calculation – sideflexing conveyors

$$\Delta T = 9{,}81 \bullet \{[(M + W) \bullet L_H \bullet K_1] + [M_a \bullet L_a \bullet (K_2 + K_1) - M \bullet L_a \bullet K_1] + [(M \bullet W) \bullet L_V]\}$$

(1) (2) (3)

The used symbols are:

- ΔT = pull increment of the section of chain in newtons
- L_H = horizontal length of the section (in metres)
- L_V = vertical height of the section (in metres)
- M = conveyed product weight (kilograms per metre of chain)
- W = chain weight (kilograms per metre)
- K_1 = coefficient of friction between chain flights and wear strips
- L_a = length in metres of the accumulating section on the conveyor
- M_a = accumulated product weight (kilograms per metre)
- K_2 = coefficient of friction between chain flights and accumulated product

In case of sideflexing, with or without incline, with or without accumulation section, the calculation is more complex.
The formula shown above, allows the calculation of the pull increase relative to a section of the conveyor, only one way (carrying or return), including one curve.

The calculation proceeds as follows:

A) Divide the conveyor running, both carrying and return, in several sections consisting of a straight part and a sideflexing part, proceeding in direction of product flow.

B) Number the sections starting from the motor gear, in increasing order following the direction of product flow.

C) Calculate the pull in point 1 using the formula shown above, multiply the result by K_c (angle factor) relative to the first section, (see Table "p")
D) Add the pull of the previous section to the increment obtained from the application of the formula to the second section and multiply the result by the angle factorrelative to the second section (if there is a curve).
E) Repeat step D) for all other sections, untill the sprocket, which is the maximum point pull.

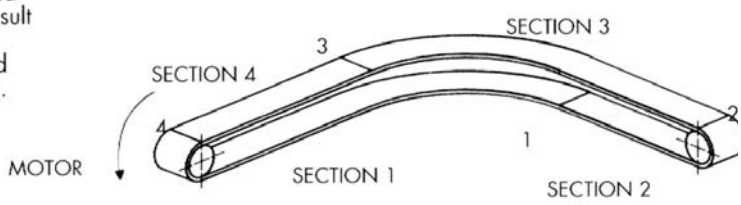


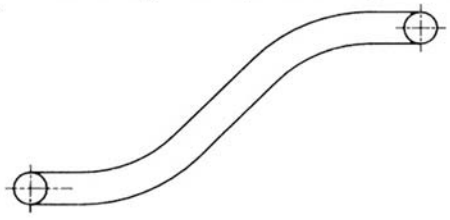
TABLE "p"

K_c ANGLE FACTOR

TURNING ANCLE	WITH TURNING DISK	COEFFICIENT OF FRICTION K_1 = 0,1	K_1 = 0,15	K_1 = 0,20	K_1 = 0,25	K_1 = 0,30	K_1=0,35	K_1 = 0,40
15°	1,15	1,03	1,04	1,06	1,07	1,08	1,10	1,12
30°	1,15	1,05	1,08	1,10	1,14	1,17	1,20	1,21
45°	1,15	1,08	1,13	1,17	1,22	1,28	1,32	1,37
60°	1,15	1,11	1,17	1,23	1,30	1,37	1,44	1,51
75°	1,15	1,14	1,22	1,30	1,39	1,48	1,58	1,69
90°	1,15	1,17	1,27	1,37	1,48	1,60	1,73	1,88
120°	1,15	1,23	1,37	1,51	1,69	1,87	2,08	2,28
150°	1,15	1,30	1,48	1,69	1,92	2,19	2 50	2,86
180°	1,15	1,37	1,60	1,87	2,19	2,56	3,00	3 50

Note that K_c (angle factor) is the same either for vertical or horizontal curves, as you will find at the beginning and at the end of an inclined conveyor.

For the example shown in the picture below you must use the formula for sideflexing even if in plan the conveyor has no curves.



Note that in the return section of an inclined conveyor, it is possible to verify a negative pull, that means that the chain moves due to gravity. In this case instead of multiplying by the angle factor you must divide by it.

If the conveyor is not inclined, part "3" of the formula will be equal to zero.

If the conveyor does not have the accumulation section, part "2" of the formula will be equal to zero.

Chain pull calculation - elevators

$$\Delta T = 9{,}81 \bullet \{(M \bullet K_G + 2W) \bullet L_H \bullet K_1] + [(1 + K_1) \frac{\propto}{\mu} M \bullet L_V] + (2W \bullet L_V)\}$$

Elevating conveyors consist of two chains with rubber pads, parallel running and assembled symmetrically one in front of the other.
The product does not lay on a horizontal plane, but is held between the pads.

The formula shown above, allows the calculation of the pull increase relative to a section of the conveyor, only one way (carrying or return), including one curve.

The calculation proceeds as follows:

The used symbols are:

- ΔT = chain pull increment in one section in newtons
- M = conveyed product weight (kilograms per metre of chain)
- W = chain weight (kilograms per metre
- L_H = horizontal length of the section (metres
- L_V = vertical height of the section (metres)
- K_1 = coefficient of friction between chain flights and wear strips
- $\propto$ = coefficient of friction between rubber and product, in most cases a precautionary value of 0,25 can be used
- K_G = mesh load factor of the rubber pad on a particular product. With $\mu = 0{,}25$ KG = 4,12

A) Divide the conveyor running, both carrying and return, in several sections consisting of a straight part and a sideflexing part, proceeding in direction of product flow.

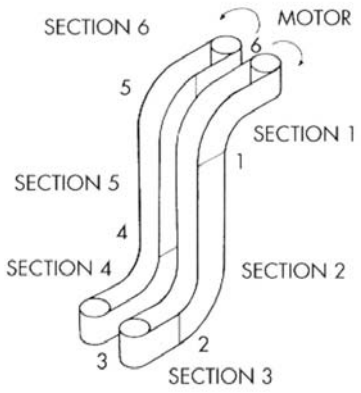
B) Number the sections starting from the motor gear, in increasing order following the direction of product flow.

C) Calculate the pull in point 1 using the formula shown above, multiply the result by Kc (angle factor) relative to the first section, (see Table "p"), or devide by K_C if the pull is negative.

D) Add the pull of the previous section to the increment obtained from the application of the formula to the second section and multiply the result by the angle factor relative to the second section (if there is a curve), or divide if the pull is negative.

E) Repeat step D) for all other sections, untill the sprocket, which is the maximum point pull.

The pull obtained is to e considered as the total pull on the pair of chains that form the elevating conveyor.



Power absorption

$$kW = T_{max}[N] \bullet speed[m/min] / 60000$$

The following formula gives the power absorbed by the chain itself on continuous operation.
To chose the power of the motor you should consider a starts and stops factor and transmission efficiency. Generally a power of 1.5 times higher is needed with continuous operation and 2 times higher with frequent stars and stops.
Anyway the correct choice of the motor depends also on its kind (electric, air, hydraulic) and the type of transmission (friction, reducer).

Coefficients of friction

Below listed coefficients can be used as a guideline. Dependent on environmental and application requirements (temperatures, lubricant, material combinations, dirt/debris, product and chain/belt surfaces, etc.) the coefficients are subject to variation. Coefficients of friction are subject to permanent tests in our laboratories.

Coefficient of friction between chain and wearstrip

Chain/belt material	Lubrication	Wearstrip material				
		Stainless steel, C-steel	UHMWPE PA	Nolu-S	Return roller	Extra With metal strip for M & TAB chains
SSE SPS	Dry	0.50	0.40	0.37	0.20	not applicable
	Water	0.40	0.30	0.28	0.15	
	Water&soap	0.20	0.20	0.19	0.10	
	Oil	0.20	0.20	0.19		
LF-Acetal (D, W)	Dry	0.30	0.25	0.22	0.20	0.19
	Water	0.23	0.21	0.19	0.15	0.17
	Water&soap	0.15	0.15	0.14	0.10	0.12
	Oil	0.10	0.10	0.10		
XPG-Acetal	Dry	0.25	0.20	0.17	0.20	0.16
	Water	0.20	0.18	0.16	0.15	0.14
	Water&soap	0.15	0.15	0.14	0.10	0.13
	Oil	0.10	0.10	0.10		
NG-PBT	Dry	0.22	0.18	0.15	0.20	0.13
	Water	0.20	0.16	0.14	0.15	0.12
	Water&soap	0.15	0.15	0.14	0.10	0.11
	Oil	0.10	0.10	0.10		

Coefficient of friction between chain and product

Chain/belt material	Lubrication	Product material					
		Paper, cartoon	Metal (steel)	Plastics incl. PET	Glass (return)	aluminium	New glass, ceramics
Stainless steel, steel	Dry	0.40	0.50	0.30	0.47	0.35	0.35
	Water		0.40	0.25	0.31	0.30	0.30
	Water&soap		0.20	0.15	0.21	0.20	0.15
Speed-Line	Dry	0.40	0.50	0.27	0.40	0.32	0.29
	Water		0.40	0.23	0.26	0.27	0.24
	Water&soap		0.20	0.13	0.18	0.19	0.13
LF-Acetal (D, W)	Dry	0.35	0.30	0.21	0.24	0.25	0.20
	Water		0.23	0.16	0.18	0.18	0.15
	Water&soap		0.15	0.13	0.14	0.14	0.12
XPG-Acetal	Dry	0.30	0.25	0.18	0.20	0.20	0.15
	Water		0.20	0.14	0.15	0.15	0.13
	Water&soap		0.15	0.12	0.12	0.13	0.12
NG-PBT	Dry	0.30	0.25	0.13	0.14	0.15	0.12
	Water		0.20	0.12	0.13	0.14	0.12
	Water&soap		0.15	0.10	0.11	0.12	0.10
LBP	Dry	0.10	0.10	0.10	0.10	0.10	0.10
VG	Dry	0.60	0.73	0.50		0.50	0.50

Parameters causing wear

Operating conditions
- Load
- Speed
- Number of starts per hour
  - Starts with/without load
  - Soft start/frequency inverter controlled drive
- Product accumulation
  - Conveyor control system (PLC)
- Lubrication
- Water quality
  - Concentration of chlorines
  - Water hardness
  - Contaminations
  - Capacity of water supply
- Lubricant
  - Suitability/performance
  - Dosing
  - Efficiency of nozzles

Cleaning
- Cleaning agent
  - Frequency
  - Intensity
  - Rinsing
- Chemical attack

Environment
- Temperature
- Humidity
- Wear increasing media/abrasives
- Corrosion
- Cleanness
  - Soil e.g. from construction work

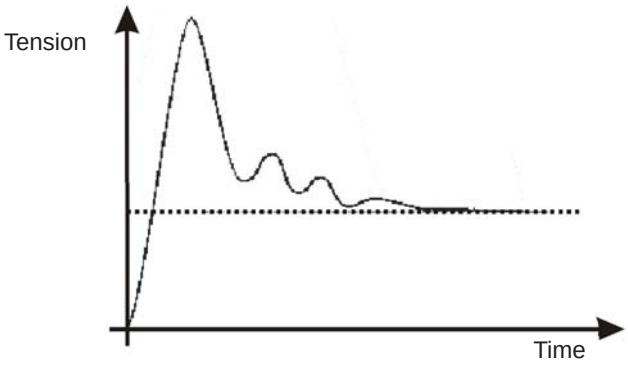
Conveyor components
- Material quality
- Construction
- Dimensional accuracy of
  - Wear strips
  - Sprockets
  - Idlers
  - Return rollers
  - Shaft alignment

Conveyor construction
- Choice of chain/belt/suitability of selected chain/belt for the application
- Catenary design
  - Tensioner
- Sprocket construction
  - Tooth geometry
  - Pitch line clearance
  - Number of teeth/polygon effect
- Return part construction
  - Smooth feed in
  - Sliding/rolling
- Mounting of wear strips
  - Flatness
  - Chamfers
  - Raised portions
  - Extension compensation gaps
- Lubrication system
- Cleaning system

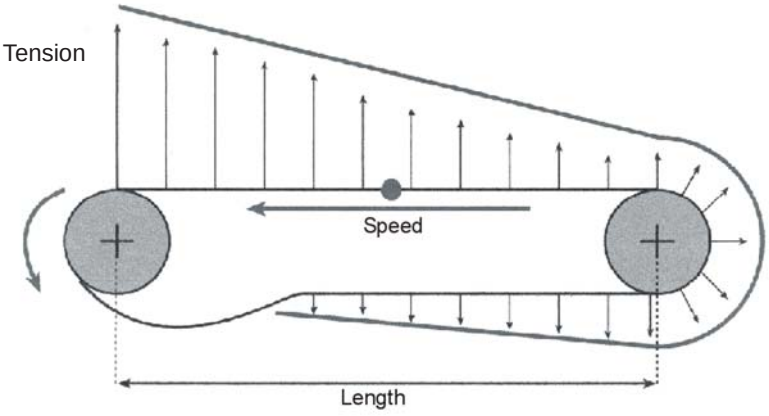
Changed/modified conditions
- Changed operating conditions
- Modification of conveyor or it's parts/components
  - Maintenance
  - Overhaul

Forces on the chain

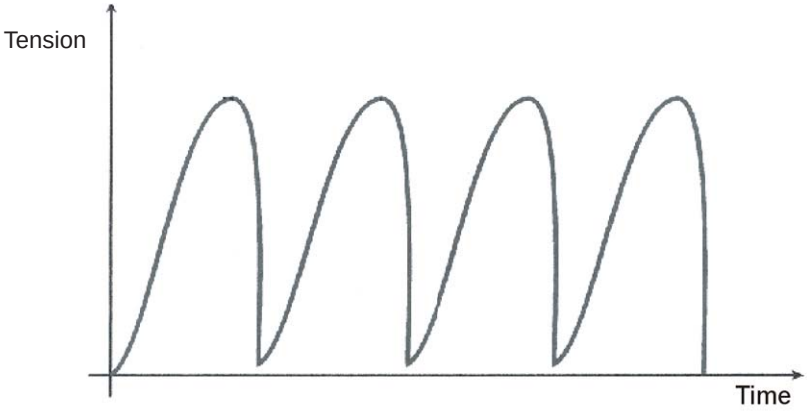
Start-up



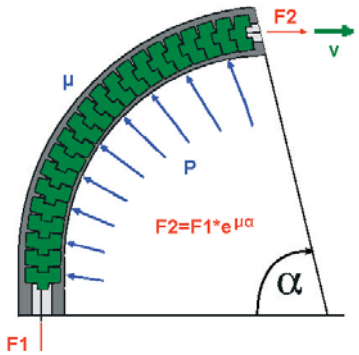
Working cycle



Force on chain link



Forces in the curve



PV

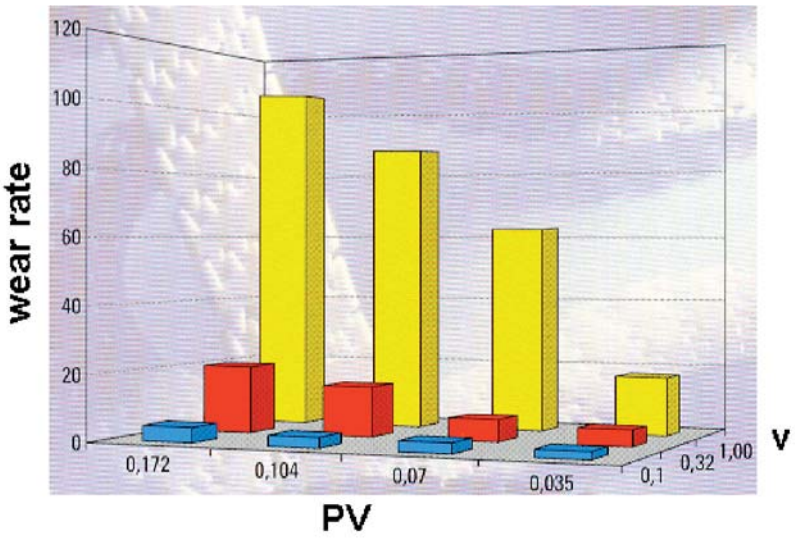
PV = pressure x velocity

PV [W] = P [N/ mm^2] x v [m / s]

P = f (F1,F2,A), A = contact surface

PV is a material property and indicates the wear resistance.

The higher the PV, the higher the generated heat, the higher the wear being a function of the heat.



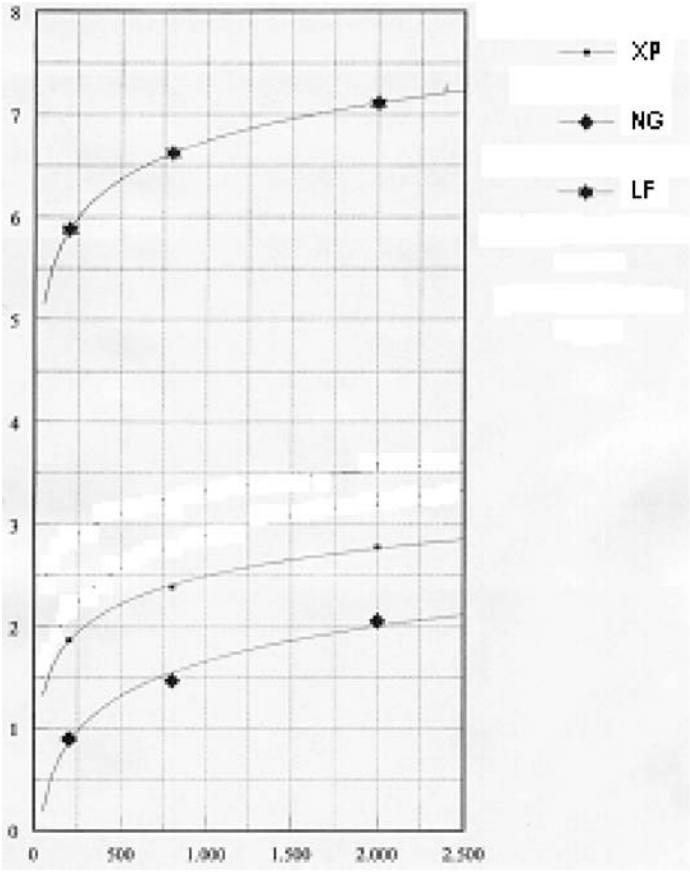
Different pressure and different velocities lead to different wear rates.

The effect is amplified dynamic operating conditions as shown above.

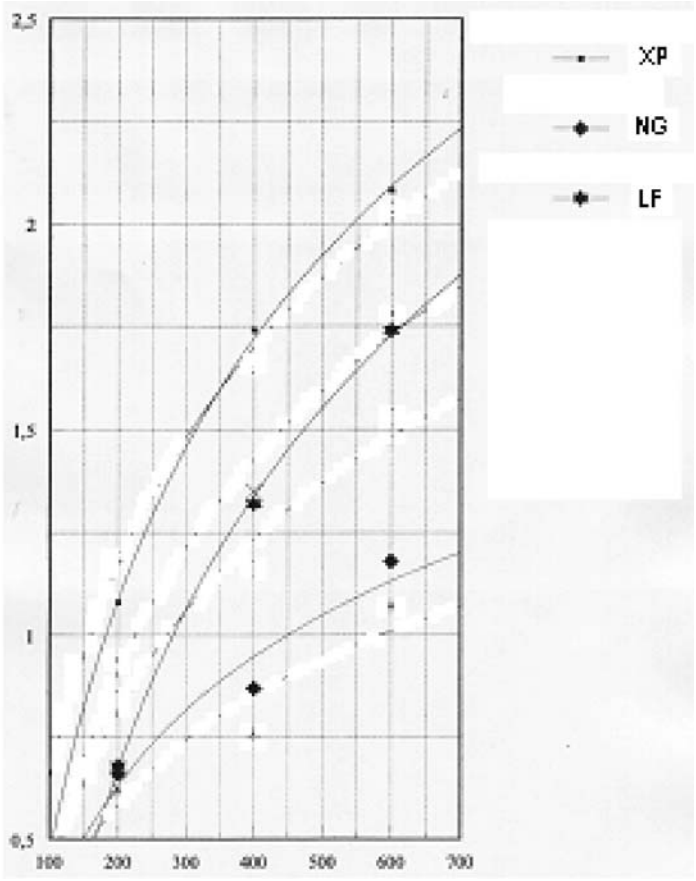
Experimental results of wear tests - NG against Acetal

The diagrams show the wear rate in 0/00 over the test duration in h.
Test performed under dry run conditions.

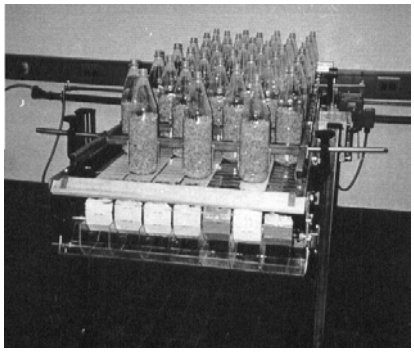
Tested with 1.5 l PET bottles



Tested with 1 l glass bottles



Test station



MAINTENANCE

Lubrication

Synthetic lubricants offer:
- Concentration independent on water properties e.g. hardness.
- Less foam.
- No slippery factory floors.
- Less bacteria growth.

Soap based lubricants offer:
- Best possible lubrication, because lubricant sticks to the chain.

Lubrication suppliers' advice is strongly recommended.

Aspects of dry running conveyors:
- Savings on investment (lubrication system, lubricant, water treatment, etc.).
- No packaging damage.
- Increased coefficient of friction and therefore wear.
- Extra cleaning required.
- Slip stick effect possible.
- Built up of electrostatic charges possible.
- Higher noise level.
- Not applicable for high speed applications.

Dirt and debris must be removed by cleaning to avoid increase of coefficient of friction and wear on all components of the conveyor.

Cleaning

Cleaning is most important in order to achieve:
- Hygienic system
- Clean products
- Reduction of friction and wear
- Removal of abrasives

Removal of remaining cleaning agents with flush water is recommended.

Cleaning dry running conveyors
With dry running conveyors there is no continuous cleaning like with lubricated conveying. All products (beer or lemonade) spilled on the chain/belt will result in pollution of the containers, increasing the friction, and the risk of products toppling over.
Therefore dry running conveyors should be cleaned even more frequently than lubricated chains. How often depends very much on the circumstances, e.g. when liqueurs are bottled and spilled, it might be necessary to clean every time the line stops for a few hours.

Cleaning stainless steel chains
This type of chain will be lubricated in most cases. Dirt etc. is flushed away continuously.
Normally, it is recommended to clean the chain regularly with hot water (max 80°C) or cold water with a cleaning agent to stop and remove any form of bacteria growth.

There are often positions where product (beer or soft drinks) is spilled on the chain. In these positions the lubrication will not function optimally, and a more frequent cleaning could be required, e.g. once every week. It could be necessary to use a brush in addition to the hot water or cleaning agent to remove e.g. broken grass etc.

Cleaning plastic chains

For lubricated plastic chains, almost the same counts as for stainless steel chains. But when using cleaning agent attention should be given to its compatibility with the chain material.

With respect to cleaning, it is obvious that the Magnet System offers great advantages because the chain can be taken out of the curve and cleaning takes less time than with conventional curve systems.

Cleaning plastic belts

Basically, cleaning of plastic belts is not different from cleaning plastic chains. Again, the chemical resistance of the materials against the cleaning agents must be checked beforehand.

Flat Top belts have to be cleaned from the top and underside. Flush Grid belts can be cleaned very effectively, due to the open area. Water can be sprayed through the belt to clean it.

Inspection

A good condition of the line can be maintained when people recognise initial signs of wear/failure and react accordingly.

Generally, all components of a conveyor should be checked at once.

Check the condition of the chain/belt regularly, and replace links/modules which are damaged. Important in this matter is to try to find the cause of the damaged links/modules. Wear patterns or damage on a chain or belt can often lead to a problem area elsewhere in the conveyor.

It is very important to replace damaged modules in plastic belts and links in plastic chains as soon as possible since small damage could lead to bigger damage if it is not repaired. If any damage is found such as pieces of plastic broken off, or a wear pattern at the side of the belt, the cause of the problem should be located.

Cleaning instructions

General remarks

Cleaning of chains and belts is necessary for the following reasons:

- ➢ Minimization of dirt / debris
- ➢ Minimization of germ formation
- ➢ Minimization of product scarp
- ➢ Maximization of production stability / continuity

Clean operating conditions substantially improve:

- ➢ Service life of chains and belts
- ➢ Service life of components e.g. wear strips and return part components
- ➢ Prevention of crashes caused e.g. by glass debris and wrapping debris
- ➢ Prevention of malfunctions caused e.g. by sticky residues.

Careful cleaning includes all components of a conveyor:

- ➢ All components which are in direct contact with chains / belts
- ➢ All components which affect indirectly the service life of chains / belts such as return shafts:

- Upper side of chains / belts
- Opposite side of chains / belts
- Wear strips / rollers in the return part
- Wear strips in the upper part
- Sprockets and idler
- Shafts of return rollers and idler
- Return guide shoes

Cleaning schedules depend on:

- ➢ Production requirements
- ➢ Actual cleanness of chains / belts

- ➢ Any case a conveyor should be cleaned before the first start-up in order to remove all dirt/debris/residues from the assembly.The same should be done when a conveyor is restarted after a longer period out of order.

We recommend permanent inspection of the actual cleanness of conveyors and chains / belts. If extraordinary cleaning is required this should be done without delay.

Regarding the choice of cleaning agents the followuing must be considered:

- ➢ Chemical resistance of the chain/belt materials
- ➢ Example:
  - pH 7 (neutral) is recommended
  - recommended pH range4-10
  - Chlorine (warm), Ammoniac (warm) should only be used in very low concentrations <7%. Only short contact time is allowed.
  - Strongly caustic agents e.g. phosphoric acid (warm) ,salt acid,formic acid,sulphuric acid,(warm),saltpetre acid,potassium hydroxide,sodium hydroxide,hydrogen peroxide (warm) and solvents like Acetone should be avoided with plastic chains / belts.

Using cleaning agents the following should be considered:

- ➢ In the actual catalogues
- ➢ On our internet site:www.systemplast.com/documenti/chemicalpg.htm
- ➢ In the Engineering Manual

In case of doubts/question don't hesistate calling us.

Cleaning process

Selection of the best suitable cleaning process can only be done by the plant operator according to the special requirements and circumstances of his production unit.

We are only able to give general recommendation based on our experience. In any case our recommendation must be checked carefully by the plant operator reading applicability.

Pre-cleaning

- Stop conveyor,remove debris e.g. broken glass,wrapping piecies,cords,wood piecies
  - Also in the return part
- means:
  - cold/warm water up to 60°C
  - brush,hose,pressure cleaner up to 80 bar
- If possible let the conveyor run.Clean it from all sides:driet dirt,germ,sticky dirt
- Sprockets,idlers
- Upper chain/belts guides
- Guides in the return part

Cleaning

- means:
  - cleaning solution and user manual of cleaning agent supplier
  - brush,perssure cleaner to apply the cleaning solution
- If possible let the conveyor run.Clean it from all sides.Make sure that all surface with cleaning solution.
- Sprockets,idlers
- Upper chains/belts guides
- Guides in the return part
- regards the recommended exposure time of the cleaning agent

Rinsing

- means:
  - cold/warm water up to 60°C (regard recommendations of the cleaning agent supplier)
  - brush,hose,pressure cleaner up to 80 bar
- If possible let the conveyor run.Rinse it from all sides.
- Sprockets,idlers
- Upper chain/belts guides
- Guides in the return part

Repeat these steps until the favoured cleaning result is reached.

Disinfection

Is necessary to prevent alternating contamination of chains/belts and product.

- means:
  - disinfection agent and user manual of the supplier
  - brush,pressure cleaner
- If possible let the conveyor run.Disinfects it from all sides.Make sure that all surface are convered with disinfection solution.
- Sprockets,idlers
- Upper chain/belts guides
- Guides in the return part
- regards the recommended exposure time of the disinfection agent

Rinsing

- means:
  - cold/warm water up to 60°C (regard recommendations of the cleaning agent supplier)
  - brush,hose,pressure cleaner up to 80 bar
- If possible let the conveyor run.Rinse it from all sides.
- Sprockets,idlers
- Upper chain/belts guides
- Guides in the return part

Drying/blowing off

Die to the fact that it most cases drying the conveyor completely is not possible it is recommended to remove at least big water residues.

Inspection

- Check the cleaning result carefully (all components) and repeat the procedure if necessary.
- Before re-starting the conveyor make sure that all cleaning means were removed.

Other components

This cleaning procedure is also applicable to other components of a conveyor which are not in direct conact with chains/belts:

- Basic construction:pads.pods.clamps
- Product guides:guide rails,side brackets,traverses, clamps
- Drives,supports,sensors,casing:regard special instructions about cleaning electric devices!

Critical sections of a conveying line which need special attention regarding cleaness

This list considers standard layouts conveying lines.In those sections ,the danger of high wear is significant.For this reason cleanness is essential to increase service life of all components and to avoid malfuctions as well as product scrap.

- Return boxes all the way to the de-cases or washer
- Return boxes all the way to the washer
- One way and return bottles in high speed section:
  - filler
  - labeller
- One way and return bottles in side transfer sections and pressure less combiners
- One way and return bottles in accumulation tables and buffer section in front of machines:
  - filler
  - labeller
  - pasteurizer
- Create conveying in the dry end

Generally it must be noticed that dry sections must be inspected very carefully regarding clean conditions.

In such sections no permanent cleaning by means of lubrication spray devices is taking place. As a consequence out of insufficent cleaning wear at the following components can be observed:

- curve guides
- wear strips
- chains/belts
- return components

Only due to the higher friction in such sections the wear rate is already higher compared to lubricated section.If cleaned properly,the service life of components can be increased significantly.

Additionally to regular cleaning cycles it is recommended to blow off particularly the curve guides in short intervals.

EXTRA curve guides with metal wear recommended anyway.

Inspection procedure

1. Inspect chains for unusual wear patterns,nicks,or damage.
2. Look for excessive gaps between chain flights.
3. Check conveying surface for flatness,bent or broken flights.
4. Inspect hold-down tabs or beveled sliding surfaces for excessive wear.
5. Review chain catenary sag for proper amount.
6. If take-ups are used,check that take-up tension is not excessive.Do not preload chain.
7. Check all idlers,rollers,turn discs and sprockets for freedom of rotation.
8. Examine sprockets for excessive wear.
9. Look for debris build up in sprocket tooth pockets.
10. Check for excessive guide ring wear.
11. Check all wear strips and fasteners for excessive wear.
12. Check all transfer points,dead plates,turn tables,turn discs and sprockets for proper elevation and alignment.
13. Review function of lubrication system.
14. Inspect general cleanliness of conveyor system.

Installation procedure

1. Check all sprockets,idlers,turn discs and rollers for proper elevation and alignment with regard to the conveyor tracks.
2. Check all wear strips (carrying and return),dead plates, dividers and transfers mechanism for proper location, elevation, spacing and flatness.
3. Check all fasteners for proper tightness (torque).Fasteners used on wear strips and dead plates must have recessed heads.
4. Check all conveyor splice points for proper elevation,alignment and fastening.
5. Inspect conveyor system for obstructions by pulling a short section of chain (1 metre) trought the entire conveyor.
6. Check lubrication system (if present).
7. Install conveyor chain, assuring that the following has been done:
   A. Check for correct direction of chain travel.
   B. Assemble chain in 3 meters sections and avoied twisting or damaging the chain.
   C. Connect chain sections on the conveyor.Insure that all pins and top plates are flush and propely secure.
   D. Adjust chain catenary (sag) to the proper elevation.Note:Readjustment is usually necessary following operation under loading conditions.
   Although not to overload the chain.
8. Insure that lubricant is evenly dispersed through conveyor system.See lubrication section for more information.
9. Start up conveyor by jogging and/or using short running periods before loading the system. Be alert to unusual noises or actions.If problem should occur ,refer to the trouble shooting guide.

Trouble shooting

Chain/belt jumps on sprocket or does not release well

Possible causes	Remedy
Chain/belt is elongated e.g. due to wear or overloading	Replace chain/belt and sprocket. Check other components as well.
Improper catenary sag	Check dimensions and adjust
Sprocket is worn	Replace sprocket
Wrong sprocket type	Install correct sprocket
Misaligned sprocket	Check and adjust
Improper sprocket position	Check and adjust position

Slip stick operation

Possible causes	Remedy
Slip stick	Use lubrication. Reduce chain/belt tension by shortening the conveyor
Return roller diameter too small	Install larger rollers
Chain/belt catches the conveyor	Remove obstructions. Check return part as well

Damaged chain hinges

Possible causes	Remedy
Overloading	Replace chain/belt. Check sprockets and other components as well
Blocking and obstructions	Check the complete conveyor
Exceeding the minimum backflex radius	Check conveyor construction

Elongation

Possible causes	Remedy
Overloading	Replace chain/belt. Check sprockets and other components as well
Wear from dirt in hinges	Improve cleaning

Rapid curve wear

Possible causes	Remedy
Overheating	Use EXTRA curve
Embedded abrasives	Replacement

Chain drifts sideways on sprocket

Possible causes	Remedy
Bad shaft/sprocket alignment	Adjust or use collars
Conveyors is not level	Adjust

Cracked hinge eyes

Possible causes	Remedy
Stress-corrosion caused by incompatible chemicals	Replacement. Check chemicals

Chains for Magnetic System come out of curve

Possible causes	Remedy
Worn curve	Replacement
Improper chamfering of the infeed Or other obstructions	Check and adjust/rework
No controlled start-up	Install frequency inverter drives
Curve not mounted level	Check and adjust

Rusted steel chain

Possible causes	Remedy
Incompatible combination of chain material and chemicals. May occur even with stainless steel.	Use only compatible chemicals Consider higher graded material

Excessive chain/belt wear

Possible causes	Remedy
Pollution	Improve cleaning
Failing lubrication	Contact lubricant supplier
Obstructions	Check all sections
Debris in return part	Cleaning. Install roller with larger diameter

Sprockets don't slide on shaft when belt extends due to temperature increase

Possible causes	Remedy
Pollution	Improve cleaning
Axial fixing incorrect	Re-adjust axial fixing according to temperature situation

Rapid wear on sprockets

Possible causes	Remedy
Abrasive conditions	Improve cleaning Use steel sprockets

Please help us completing that list by informing us of your experiences.

Replacement criteria

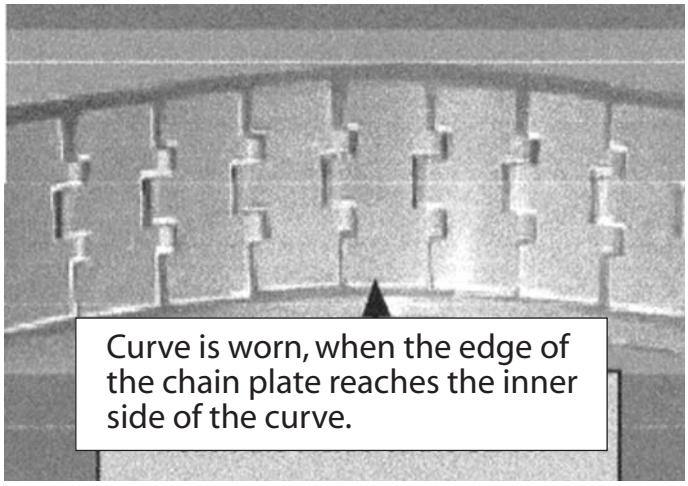
Chains must be replaced, when
- Pitch is elongated more than 3%.
- Thickness of the plate is reduced to less than 50%.
- The surface becomes very unflat/uneven or rough, dependant on application.
- Side of sideflexing chains is worn to such an extent, that the pin is exposed.
- Chain jumps on the sprocket.

Chains of inliners/pressureless combiners should be changed all at once.

Belts must be replaced, when
- Thickness of the plate is reduced by 1 mm from the top and from the underside.
- The surface becomes very unflat/uneven or rough, dependant on application.
- Belt jumps on the sprocket.
- As a guideline, 3% elongation is tolerable.

When replacing chains/belts, it is recommended to replace wearstrips and sprockets/idlers as well.

Replacement of **Dual Magnetic Corner Tracks**



In case of multitrack curves, check all tracks.

Sprockets and idlers must be replaced, when
- Teeth show hooked shape and chain releases not well.
- Teeth are damaged.
- Chain jumps on sprocket.
- Bore of idlers is worn out and idler starts oscillating.
- Hub or keaway are damaged.
- New chain is installed.

Wearstrips must be replaced, when
- Thickness is reduced to less than 50%.
- Dirt or debris is embedded.
- Fixing bolts protrude.

CHEMICAL AGENT	POLYAMIDE				POLYPROPYLENE				ACETAL RESIN				POLYETHYLENE				BRASS				RUBBER								STAINLESS STEEL			
	PA				PP				POM				PE				OT .NI.				NBR				VITON				AISI 304			
	C				C				C				C				C				C				C				C			
	Note	%	23° C		Note	%	23° C		Note	%	23° C		Note	%	23° C		Note	%	23° C		Note	%	23° C		Note	%	23° C		Note	%	23° C	
Acetic acid	S	10	★			40	●			5	★			10	●				❍				★			20	★			20	●	
Acetone		100	●				●				❍				●				●				★				★			25	●	
Acrylonitrile		100	●				●																★				★					
Aluminium chloride	S	10	●				❍														S		●		S	SA	●				❍	
Aluminium sulphate	S	10	●				●								●						S		●		S	SA	●					
Amyl alcohol		100	●				●								●												●				●	
Ammonia		10	●			30	●		S		●				●				★		S		❍		S		❍			100	●	
Ammonium chloride	S	10	●		S	10	●														S		●		S	SA	●				❍	
Aniline		100	❍				●							3	●								★				●				●	
Barium chloride	S	10	●				●														S		●		S		●				❍	
Beer			●				●				●				●				●				●				●				●	
Benzene							●				●				❍															70	❍	
Benzic acid	S	SA	❍			SA	●														S		●		S		●			100	●	
Benzol		100	●				❍				●				❍				●				★				❍				●	
Boric acid	S	10	●			SA	●							SA	●						S		●		S	SA	●			SA	●	
Brine			❍				❍								●																❍	
Butter			●				●				●				●				●				●				●				●	
Butyl acetate		100	●				❍																				★					
Butyl alcohol		100	●				●																❍				●				●	
Butyl glycole		100	●				●																									
Calcium chloride	S	10	●		S	50	●							SA	●				●		S		●		S	SA	●				❍	
Carbon sulphide		100	●				●				●												★				●				●	
Carbon tetrachloride			●				★				●								●				★				●			10	●	
Chlorine water							★				★				★																★	
Chloroform		100	★				❍				★				★				●				★				●				●	
Chromic acid	S	1	❍																		S		★			50	●			10	●	
Citric acid	S	10	❍			10	●				❍				●				★		S		●		S	SA	●			25	●	
Cyclohexane		100	●				●																●				●					
Cyclohexanol		100	●				●																●				●					
Decalin			●				❍																❍				★					
Dioxane			●				❍																★									
Distilled water			●				●				●				●				●								★				●	
Ethyl acetate		100	●				●																★				●				❍	
Ethyl alcohol		96	●			96	●				●												❍				❍			10	●	
Ethyl cloride		100	●				★								❍				❍				❍				★				●	
Ethyl ether		100	●				●																				●					
Ferric chloride	S	10	●				●														S		●		S	SA	●				❍	
Food fats			●								●				●								●				●				●	
Food oils			●				●				●				●								●				●				●	
Formaldehyde	S	30	●		S	40	●				●				❍				●			40	❍			40	★			100	●	
Formic acid	S	10	★							10	★			10	★				●				★				❍				★	
Freon 12	L		●																				●				●				●	
Fresh water			●				●				●				●								●				●				●	
Fruit juice			●				●				●				●								●				●				❍	
Gasoline			●				❍								❍				❍				❍				●				●	
Glycerine			●				●				●				●				●				●				●				●	
Hydrocloric acid	S	10	★		S	30	●			35	★			35	●				❍		S	10	❍			37	●				★	
Hydrofluoric acid	S	40	★			40	●							70	●							65	★			48	●				★	
Hydrogen peroxide	S	3	★																		S	80	★			90	●				●	
Isopropyl alcohol			●				●																				●				●	
Lactic acid	S	10	●		S	20	●				●				●				★		S		●				●				❍	
Linseed oil			●				●				●				●								●								●	

CHEMICAL AGENT	POLYAMIDE				POLYPROPYLENE				ACETAL RESIN				POLYETHYLENE				BRASS				RUBBER								STAINLESS STEEL			
	PA				PP				POM				PE				OT .NI.				NBR				VITON				AISI 304			
	Note	C %	23° C		Note	C %	23° C		Note	C %	23° C		Note	C %	23° C		Note	C %	23° C		Note	C %	23° C		Note	C %	23° C		Note	C %	23° C	
Magnesium chloride	S	10	●		S	SA	●														S		●		S	SA	●				❍	
Methyl acetate		100	●				●																★				★				❍	
Methyl alcohol		100	●								●						●						❍				❍		80		●	
Methylene chloride		100	●				❍				★				❍								★				❍				❍	
Milk			●				●				●				●		●						●				●				●	
Mineral oil			●				●				●				●								●				●				●	
Nitric acid		10	★		S		●			5	●			5	❍						S	10	★			70	●			65	●	
Nitrobenzene		100	❍				●																★				❍					
Oleic acid		100	●				●								❍		●						❍				❍				●	
Oxalic acid	S	10	❍		S	50	●														S		❍		S		●			65	●	
Paraffin											●				●																	
Petroleum			●				●				●				★		●						●				●				●	
Petroleum ether			●				●				●						●						★				●				●	
Phenol	S		★				●																★				●				●	
Phosphoric acid	S	10	★			85	●			10	★			95	●			★			S	20	❍			85	●				★	
Potassium bichromate	S	5	❍		S	10	●														S		❍		S	SA	●					
Potassium bromide	S	10	●			SA	●														S		●		S		●					
Potassium hydroxide	S	10	●			50	●			25	★			25	●						S		❍		S		●			50	●	
Potassium permanganate		1	★		S		●														S		★		S		●				●	
Sea water			●				●				❍				●		●						●				●				●	
Silicone oil			●				●																●				●					
Silver nitrate			●		S	20	●														S		❍		S		●				❍	
Sodium carbonate		10	●		S	SA	●				●				●						S		●		S		●			100	●	
Sodium chloride	S	10	●		S	SA	●				●				●			●			S		●		S	SA	●				❍	
Sodium hydroxide	S	10	●																		S		❍								●	
Sodium hypochlorite	S		●		S	20	●				★				●						S		★			5	●				★	
Sodium silicate			●																		S		●				●			100	●	
Sodium sulphate	S	10	●																		S		●		S		●			100	●	
Soft drinks			●				●				●				●								●				●				●	
Suds	S		●				●				●				●						S		●				●				●	
Sulphuric acid	S	10	★			98	●			40	★			40	❍			●			S		★			95	●				★	
Tartaric acid			●		S	10	●			30	❍				●			★			S		●				●			50	●	
Tetrahydrofuran			●				❍																★				★					
Tetralin			●				★																★				●				★	
Tincture of iodine			★				●								●			★					★				●				❍	
Toluol			●				●																★				❍					
Transformer oil			●				❍																●				●					
Trichloroethylene			❍				❍																★				●				★	
Triethanolamin			●				●																★				★					
Turpentine											★				★																●	
Vaseline			●												❍								●				●					
Vegetable juice			●				●				●				●								●				●				●	
Vegetable oils			●				●				●				●								●				●				●	
Vinegar			●				●				●				●		●						❍				★				●	
Water and soap			●				●				●				●								●				●				●	
Whisky			●				●											●					●				●				●	
Wine			●				●				●				●			●					●				●				●	
Xylol			●				★				●				❍			❍					★				●				●	

Data shown in the table was taken from laboratory tests performed on unstrained samples and are merely indicative. Chemical resistance under normal working conditions can depend on various factors, such as stress and temperature, concentration of the chemical agent and duration of its effects.

ABBREVIATION
C = concentration L = liquid
SA = saturated S = solution

● = Good resistance.
❍ = Fairly good resistance depending on use conditions
★ = Insufficient resistance (not recommended).
Blank spaces = No tests performed

CHEMICAL AGENT	*SBS*	*SEBS Thermoplastic Rubber*
WATER	• • • •	• • • •
CHLORINE	• • • •	• • • •
SODIUM HIDROXINE	• • • •	• • • •
POTASSIUM HDROXINE	• • • •	• • • •
AMMONIA	• • • •	• • • •
SULPHURIC ACID	• • •	• • • •
NITRIC ACID	• • •	• • • •
HYDROCHLORIC ACID	• • •	• • • •
ACETIC ACID	• • • •	• • • •
LACTIC ACID	• • • •	• • • •
CITRIC ACID	• • • •	• • • •
HIDROGEN PEROXIDE(6% 12%)	• •	• • •
ALCOHOL	• • • •	• • • •
FOOD STABILIZERS	• • • •	• • • •
FOOD OILS	• • •	• • • •
COSMETIC PRODUCTS	• • • •	• • • •
PETROL: Shore Scale A	•	• •
Shore Scale D	• •	• • •
EMULSIFIED WATER 70%	• •	• • •
POLYGLICOL	• • • •	• • • •
MINERAL OIL: 7 h @23° C	• • •	• • •
24 h @70° C	•	• •
HYDRAULIC OIL: 7 h @23° C	• • •	• • •
24 h @70° C	• •	• • •
TOLUENE 1h @23° C	•	• • •
PETROLEUM AETHER	• •	• • •

Leganda:	
INSUFFICIENT RESISTANCE	•
LIMITED	• •
GOOD	• • •
EXELLENT	• • • •

Data shown in the table was taken from laboratory tests performed on unstained samples and are merely indicative.Chemical resistance under normal working conditions can depend on various factors, such as stress and temperature,concentration of the chemical agent and duration of iss effects.

APPLICATION TEMPERATURES

MATERIAL	SYMBOL	MIN. TEMP. °C	MAX TEMPERATURE °C DRY ENVIRONMENT	USED FOR
Carbon Steel	C45	- 70°	+ 180°	steel chains, roller chains
Ferritic Stainless Steel	Standard	- 30°	+ 400°	steel chains
Extra Stainless Steel	Extra	- 30°	+ 440°	steel chains
Extra Plus Stainless Steel	Extra Plus	- 30°	+ 400°	steel chains
Austenitic Stainless Steel	Austic	- 30°	+ 400°	steel chains, roller chains
Acetal Resin	D, W	- 40°	+ 80°	plastic chains
Low Friction Acetal Resin	LF, LFW	- 40°	+ 80°	plastic chains
Extra Performance	XP	- 40°	+ 80°	plastic chains
New Generation	NG	- 40°	+ 120°	plastic chains
Anti-Static Acetal Resin	AS	- 40°	+ 80°	plastic chains
High Temperature Resistance	HT	- 40°	+ 120°	plastic chains
Splecial Chemical Resistance	AR	- 5°	+ 100°	plastic chains
N.B.R. Rubber	NBR	- 40°	+ 110°	rubber pad, gripper
E.P.D.M. Rubber	EPDM	- 40°	+ 80°	rubber pad, gripper
Polyamide	PA	- 10°	+ 80°	sprockets, idler wheels
Reinforced Polyamide	PA.FV	- 20°	+ 120°	sprockets, idler wheels
Polypropylene	PP	- 5°	+ 100	sprockets, idler wheels
Reinforced Polypropylene	PP.FV	- 10°	+ 110°	sprockets, idler wheels
Polyethylene	PE	- 40°	+ 80°	sprockets, idler wheels

Expansion factors

D,LF,XPG,AR (Acetal): 0.12 mm/m/°C
NG (New Generation): 0.18 mm/m/°C
AS (antistatic Acetal): 0.13 mm/m/°C
CR (Polypropylene): 0.15 mm/m/°C
Approximate values.

Calculation:
Expected expansion [mm]=(width[mm]/ 1000)
**(operation temperature [°C]-21 °C)*
** expansion factor*

CONVERSION FACTORS (SI)

TO CONVERT SI (METRICI)	SIMBOL SI	DIVIDED BY FACTOR	TO OBTAIN
LENGTH			
meter	m	0.3048	foot
centimeter	cm	30.48	foot
millimeter	mm	304.8	foot
meter	m	0.0254	inch
centimeter	cm	2.54	inch
millimeter	mm	25.4	inch
meter	m	1609.34	mile
kilometer	km	1.60934	mile
meter	m	0.9144	yard
	MASS		
gram	g	28.3495	ounce (avoirdupoids)
kilogram	kg	0.0283495	ounce (avoirdupoids)
kilogram	kg	0.45359	pound (avoirdupoids)
	VELOCITY		
meter/minute		0.00508	foot/hour
meter/hour		0.3048	foot/hour
meter/minute		0.3048	foot/minute
meter/second	m/s	0.00508	foot/minute
meter/minute		18.288	foot/second
meter/second	m/s	0.3048	foot/second
	FORCE AND FORCE/LENGTH		
newton	N	9.80665	kilogram-force
newton	N	9.80665	kilopound
newton	N	0.27801	ounce-force
newton	N	4.44822	pound-force
newton/meter	N/m	175.1268	pound/inch
newton/meter	N/m	14.5939	pound/foot

NOTES

NOTES

EF115M

Alligator® Fastener Systems for Light-Duty Applications

Alligator®

FLEXCO

Flexible Steel Lacing Company

Welcome to Flexco

From product distribution centers to food processing plants, companies rely on Flexco for belt conveyor fasteners and maintenance solutions that help maximize uptime, productivity, and safety. We offer the most comprehensive selection of quality products in the industry. And we back customers with unsurpassed product and application support.

The support you need, whenever and wherever you need it

Flexco products are only available through a select network of qualified belting and industrial supply distributors. This worldwide distributor network means we can back our customers with product and application support second to no one.

From fastener selection and installation to troubleshooting, each distributor is equipped and trained to respond to both your day-to-day and emergency needs. They carry comprehensive inventories of fastener products. Plus, they are experts in all facets of belt conveyor maintenance and support.

www.flexco.com

For up-to-the-minute information on products, applications, and distributors – as well as late-breaking news and product bulletins – visit our Web site. You'll find links to:

- *Products*
- *Specification Guidelines*
- *On-line Catalog*
- *Technical Support*
- *Application Stories*
- *Frequently Asked Questions (FAQs)*
- *Product Literature*
- *Global Sales & Distribution Facilities*

You'll also find helpful links to industry trade show sites.

Mechanical Fastener Solutions from Flexco

The most respected name in belt conveyor solutions is Flexco. And for a simple reason. Flexco products set the industry's highest standards for design, ease of installation, and reliability. Plus, knowledgeable advice and proven solutions help our customers keep conveyor efficiency high and operation costs low.

Flexco fastener systems for light-duty applications

Alligator® Ready Set™ Staple Fastener System
Pages 4-9

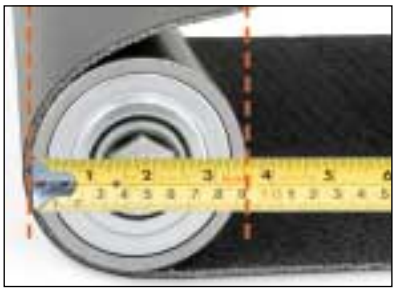
Alligator® Plastic Rivet Fastener System
Pages 14-16

Alligator® Belt Lacing Fastener System
Pages 10-13

Belt Maintenance Products
Pages 17-18

How to specify the right Flexco fastener

1. **Determine belt tension.**
   Most conveyor belting has a mechanical fastener rating. Exercise care to ensure belting or fasteners are operated within the recommended range of their capabilities.
2. **Measure belt thickness.**
   Choose a fastener size which corresponds to belt thickness in the skived area. Measure after any belt top cover has been removed.
3. **Measure the diameter of the smallest pulley in your drive.**
   Minimum pulley diameters for individual fasteners are noted in the specification charts for individual fasteners.
4. **Choose the fastener size that is appropriate for your application.**
   Use specifications for individual fastener sizes to guide your selection.



Alligator® Ready Set™ Staple Fastener System

The Alligator® Ready Set™ Staple Fastener System, featuring one-piece fastener strips with pre-inserted staples, reduces installation time by eliminating the need to handle and load individual staples. The result is a strong splice that resists impact damage, as well as a smooth, unrippled joint that simplifies hinge pin insertion.

An extended plate design separates the point of staple penetration from the line of belt flexing. This eliminates splice fatigue that can often result from sawing action at the point of attachment.

Alligator Ready Set staple fasteners are furnished in strips with a bridge between each fastener plate, thus preventing individual parts from getting into conveyed product.

The Alligator® Ready Set™ Staple Fastener System is ideal for light- and medium-duty conveyor applications including:

- *Package and baggage handling*
- *Cased goods*
- *Parts*
- *Food*
- *Agricultural products*

Easy installation. Long-lasting splice.

Simply fit the Ready Set fastener strip onto the belt ends and secure with the special installation tool for a strong, dependable splice. Designed for belts from 1,5 mm (1/16") to 6,4 mm (1/4"), Alligator Ready Set installation requires only a hammer and a lightweight installation tool that can be easily carried to and from the job site (installation tool described on page 8).

How the Alligator® Ready Set™ Fastening System Works

Staples penetrate between carcass fibers without severing them. Staples are hammer-driven through the belt and then clinched crosswise to prevent belt tension from pulling against – and unclinching – the staples.

Alligator® Ready Set™ Staple Selection Guide

Fastener Size	Operating Tension Range		Belt Thickness Range		Minimum Pulley Diameter		Approximate Hinge Pin Diameter			
							Nylon		Steel	
	kN/m	P.I.W.	mm	in.	mm	in.	mm	in.	mm	in.
RS62	17	100	1,5-3,2	1/16-1/8	50	2	2,0	.080	2,0	.080
RS125	28	160	3,2-4,8	1/8-3/16	75	3	3,6	.141	3,6	.141
RS187	35	200	4,8-6,4	3/16-1/4	100	4	5,2	.203	4,7	.187

No. RS62

- *For belts 1,5 mm (1/16") to 3,2 mm (1/8") thick*
- *Operates on minimum pulley diameter of 50 mm (2")*
- *For use on belts with mechanical fastener ratings up to 17 kN/m (100 P.I.W.)*
- *Available in steel, Type 316 stainless steel, and Type 430 Magnetic Stainless*
- *Can be coupled with No. RS125 for belt ends of slightly different thickness, as long as the minimum pulley diameter for the RS125 is met, the RS62 hinge pin is used, and belt rating does not exceed 17 kN/m (100 P.I.W.)*

No. RS125

- *For belts 3,2 mm (1/8") to 4,8 mm (3/16") thick*
- *Operates on a minimum pulley diameter of 75 mm (3")*
- *For use on belts with mechanical fastener ratings up to 28 kN/m (160 P.I.W.)*
- *Available in steel, Type 316 stainless steel, Type 430 Magnetic Stainless, and MegAlloy®*
- *No. RS125 and RS187 can be joined using a No. RS125 hinge pin. Minimum pulley diameter for RS187 must be met and belt rating must not exceed 28 kN/m (160 P.I.W.)*

No. RS187

- *For belts 4,8 mm (3/16") to 6,4 mm (1/4") thick*
- *Operates on a minimum pulley diameter of 100 mm (4")*
- *For use on belts with mechanical fastener ratings up to 35 kN/m (200 P.I.W.)*
- *Available in steel, Type 316 stainless steel, and MegAlloy®*

RS62 *RS125* *RS187* *125 MegAlloy®*

Steel: *Standard fastener material is suitable for most applications. Plated for rust and corrosion resistance.*

Stainless Steel: *Type 316 provides extra resistance to abrasion, magnetic attraction, and corrosion from acids and chemicals. Also excellent for high-sanitary requirements.*

MegAlloy®: *Superior resistance to wear and abrasion, providing several times the service life of steel. Not recommended where subject to impact or corrosion.*

Alligator® Ready Set™ Staple Fastener System

Selection Charts

Fasteners

Belt Width		Ordering Number		Belt Width		Ordering Number	
mm	in.	With Nylon Covered Steel Cable Pins (NC)	With Steel Spring Wire Pins (SP)	mm	in.	With Stainless Spring Wire Pins (SS)	With Nylon Covered Stainless Cable Pins (NCS)
RS62 Steel				**RS62 Stainless (Type 316)**			
300	12	RS62J12/300NC	RS62J12/300SP	300	12	RS62SJ12/300SS	RS62SJ12/300NCS
400	16	RS62J16/400NC		400	16		
450	18	RS62J18/450NC	RS62J18/450SP	450	18	RS62SJ18/450SS	RS62SJ18/450NCS
500	20	RS62J20/500NC	RS62J20/500SP	500	20	RS62SJ20/500SS	
600	24	RS62J24/600NC	RS62J24/600SP	600	24	RS62SJ24/600SS	RS62SJ24/600NCS
750	30	RS62J30/750NC	RS62J30/750SP	750	30	RS62SJ30/750SS	RS62SJ30/750NCS
900	36	RS62J36/900NC	RS62J36/900SP	900	36	RS62SJ36/900SS	RS62SJ36/900NCS
1050	42	RS62J42NC	RS62J42SP	1050	42	RS62SJ42SS	
1200	48	RS62J48NC	RS62J48SP	1200	48	RS62SJ48SS	RS62SJ48NCS
1500	60	RS62J60NC	RS62J60SP	1500	60	RS62SJ60SS	RS62SJ60NCS
RS125 Steel				**RS125 Stainless (Type 316)**			
100	4	RS125J4NC*		100	4		
250	10	RS125J10NC		250	10		RS125SJ10NCS
300	12	RS125J12/300NC		300	12	RS125SJ12/300SS	RS125SJ12/300NCS
350	14	RS125J14NC		350	14	RS125SJ14SS	RS125SJ14NCS
400	16	RS125J16/400NC	RS125J16/400SP	400	16	RS125SJ16/400SS	RS125SJ16/400NCS
450	18	RS125J18/450NC	RS125J18/450SP	450	18	RS125SJ18/450SS	RS125SJ18/450NCS
500	20	RS125J20/500NC	RS125J20/500SP	500	20	RS125SJ20/500SS	RS125SJ20/500NCS
600	24	RS125J24/600NC	RS125J24/600SP	600	24	RS125SJ24/600SS	RS125SJ24/600NCS
750	30	RS125J30/750NC	RS125J30/750SP	750	30	RS125SJ30/750SS	RS125SJ30/750NCS
900	36	RS125J36/900NC	RS125J36/900SP	900	36	RS125SJ36/900SS	RS125SJ36/900NCS
1050	42	RS125J42NC	RS125J42SP	1050	42	RS125SJ42SS	RS125SJ42NCS
1200	48	RS125J48NC	RS125J48SP	1200	48	RS125SJ48SS	RS125SJ48NCS
1500	60	RS125J60NC	RS125J60SP	1500	60	RS125SJ60SS	RS125SJ60NCS
RS187 Steel				**RS187 Stainless (Type 316)**			
100	4	RS187J4NC*		100	4		
300	12	RS187J12/300NC		300	12		RS187SJ12/300NCS
400	16	RS187J16/400NC		400	16	RS187SJ16/400SS	RS187SJ16/400NCS
450	18	RS187J18/450NC	RS187J18/450SP	450	18	RS187SJ18/450SS	RS187SJ18/450NCS
500	20	RS187J20/500NC	RS187J20/500SP	500	20	RS187SJ20/500SS	RS187SJ20/500NCS
600	24	RS187J24/600NC	RS187J24/600SP	600	24	RS187SJ24/600SS	RS187SJ24/600NCS
750	30	RS187J30/750NC	RS187J30/750SP	750	30	RS187SJ30/750SS	RS187SJ30/750NCS
900	36	RS187J36/900NC	RS187J36/900SP	900	36	RS187SJ36/900SS	RS187SJ36/900NCS
1050	42	RS187J42NC	RS187J42SP	1050	42	RS187SJ42SS	RS187SJ42NCS
1200	48	RS187J48NC	RS187J48SP	1200	48	RS187SJ48SS	RS187SJ48NCS
1500	60	RS187J60NC	RS187J60SP	1500	60	RS187SJ60SS	

*10 sets per box

MegAlloy® Fasteners

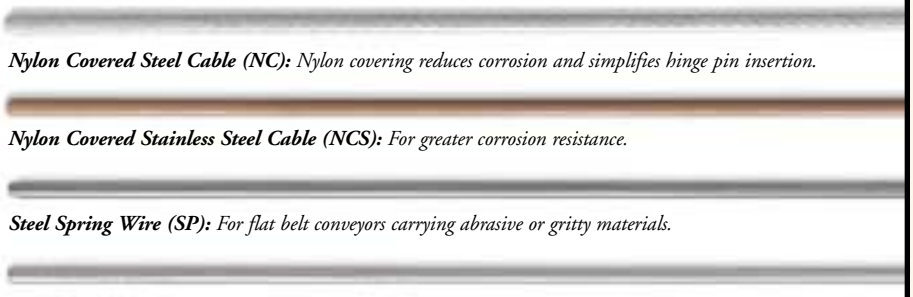
Includes sixteen 150 mm (6") fastener strips with staples. Hinge pins not included.

Ordering Number
125MA
187MA

Note: When ordering MegAlloy® fasteners or bulk ordering lacing with special staple lengths, you must use a green guide block (ST4-5, #50240) with your installation tool. When using loose staples, you can order a staple dispenser to speed up your installation of this product.

Hinge Pin Selection Chart

Wide selection makes it easy to match the correct hinge pin to the needs of your application.



Nylon Covered Steel Cable (NC): *Nylon covering reduces corrosion and simplifies hinge pin insertion.*

Nylon Covered Stainless Steel Cable (NCS): *For greater corrosion resistance.*

Steel Spring Wire (SP): *For flat belt conveyors carrying abrasive or gritty materials.*

Stainless Steel Spring Wire (SS): *For use with stainless steel fasteners.*

Hinge Pins (Extra)

For 62				For 62			
Coil Length		Ordering Number		Belt Width		Ordering Number (Packages of 10 Pins)	
M	Foot	NC62 Nylon Covered Steel Cable	NCS62 Nylon Covered Stainless Cable	mm	in.	SP62 Steel Spring Wire Pins	SS62 300 Series Stainless Spring Wire Pins
3	10	NC62-X	NCS62-X	300	12	SP62-12/300	SS62-12/300
30	100	NC62-C	NCS62-C	400	16	SP62-16/400	SS62-16/400
				450	18	SP62-18/450	SS62-18/450
				500	20	SP62-20	SS62-20
				600	24	SP62-24/600	SS62-24/600
				750	30	SP62-30/750	SS62-30/750
				900	36	SP62-36/900	SS62-36/900
				1050	42	SP62-42	SS62-42
				1200	48	SP62-48	SS62-48
				1350	54	SP62-54	SS62-54
				1500	60	SP62-60	SS62-60
For 125				**For 125**			
Coil Length		Ordering Number		Belt Width		Ordering Number (Packages of 10 Pins)	
M	Foot	NC1 Nylon Covered Steel Cable	NCS1 Nylon Covered Stainless Cable	mm	in.	SP1 Steel Spring Wire Pins	SS1 300 Series Stainless Spring Wire Pins
3	10	NC1-X	NCS1-X	400	16	SP1-16/400	SS1-16/400
30	100	NC1-C	NCS1-C	450	18	SP1-18/450	SS1-18/450
				500	20	SP1-20	SS1-20
				600	24	SP1-24/600	SS1-24/600
				750	30	SP1-30/750	SS1-30/750
				900	36	SP1-36/900	SS1-36/900
				1050	42	SP1-42	SS1-42
				1200	48	SP1-48	SS1-48
				1500	60	SP1-60	SS1-60
For 187				**For 187**			
Coil Length		Ordering Number		Belt Width		Ordering Number (Packages of 10 Pins)	
M	Foot	NC187 Nylon Covered Steel Cable	NCS187 Nylon Covered Stainless Cable	mm	in.	SP2 Steel Spring Wire Pins	SS2 300 Series Stainless Spring Wire Pins
3	10	NC187-X	NCS187-X	450	18	SP2-18/450	SS2-18/450
30	100	NC187-C	NCS187-C	500	20	SP2-20	SS2-20
				600	24	SP2-24/600	SS2-24/600
				750	30	SP2-30/750	SS2-30/750
				900	36	SP2-36/900	SS2-36/900
				1050	42	SP2-42	SS2-42
				1200	48	SP2-48	SS2-48
				1500	60	SP2-60	SS2-60

Alligator® Ready Set™ Staple Fastener System

Installation Tools and Supplies

Alligator® RSC187 Installation Tool

Holds fasteners securely in proper alignment and guides staples as they are driven. Installs two staples simultaneously for fast and simple splicing. Also provides a solid anvil surface for initial staple clinching.

The RSC187 comes complete with guide blocks and driver. Standard tool can be used to install all three fastener sizes. Also available in sizes to match a variety of belt widths. Wider tools are available for production lacing and fabrication shop requirements.

For sizes No. 62, No. 125, and No. 187

Tool Width		Ordering Number
mm	in.	
50	2	RSC187
100	4	RSC187-4
150	6	RSC187-6
300	12	RSC187-12
600	24	RSC187-24

Alligator® Ready Set™ Tool Kit

Everything needed to install Alligator® Ready Set™ Fastener Systems, in a lightweight, easy-to-carry toolbox. Includes the RSC187 installation tool, staple set plate, hand skiver, belt nippers, and 0,45 kg (1 lb.) hammer.

Description	Ordering Number
150mm (6") Installation Kit	RSTK4-6
300mm (12") Installation Kit	RSTK4-12

Staple Setting Plate

Use the Alligator® staple setting plate to achieve a smooth, finished splice. Heat-treated steel plate puts the finishing "set" on staples. Features countersunk bolt holes for easy mounting.

Ordering Number
ST-28

Alligator® Hinge Pin Cutter

Cuts bulk hinge pin cable quickly and easily. Provides a clean cut with no frayed ends.

Ordering Number
APC-1

Hinge Pin Retaining Washers

Retaining washers prevent migration of nylon-covered cable hinge pins. Check hinge pins frequently during the first few hours of operation to determine whether migration is a problem in your application.

For Fastener Number	Ordering Number
62	62-RET-50
125	125-RET-50
187	187-RET-50

Hinge Pin Bender

For use with steel spring wire pin, bends hinge pin end to prevent pin migration.

Ordering Number
PB1

Rough-Top Belt Skiver

Durable, hand-operated tool for quick and clean removal of rough top from light- and medium-duty conveyor belting. Permits lower fastener installation to minimize splice profile.

Ordering Number
RTBS

Ready Set™ Staple Guide Blocks

It is easy to convert the standard C187 Alligator® staple installation tool to Alligator Ready Set™ staples. Simply replace standard guide blocks with the ST5-5 staple guide block(s).

Includes cam lever spring

Ordering Number
ST5-5

Alligator® Belt Lacing Fastener System

For easy, economical installation and an exceptionally smooth joint, choose the Alligator® Belt Lacing Fastener System. Steel or stainless steel lacing is available in continuous lengths to fit any belt width.

One-piece design provides uniform tension across the full belt width. Also helps ensure that no loose pieces work themselves out of the belt and into conveyed product.

Easy to install

Alligator Belt Lacing installation requires no special tools, only a hammer.

Note: Alligator Belt Lacing machines are also available for production splicing. Contact Flexco for additional information.

A size to match every application

Designed for belts from 0,8 mm (1/32") to 12,5 mm (1/2"), Alligator Belt Lacing can operate over pulleys as small as 25 mm (1") in diameter, or on belts with mechanical fastener ratings to 35 kN/m (200 P.I.W.).

How the Alligator® Lacing Fastener System Works

Alligator® Lacing teeth enter parallel to the length of the belt and embed clear through the belt carcass. The design of the teeth ensures that once they are driven into the belt, the vital longitudinal carcass fibers are not severed.

The connecting bar and one continuous-piece design provides a strong, vise-like hold on the belt and evenly distributes belt tension across the entire belt width. The one-piece fastener strip ensures that no loose pieces will work out of the belt and into conveyed product. The straight splice obtained with a continuous strip of lacing also helps with hinge pin insertion.

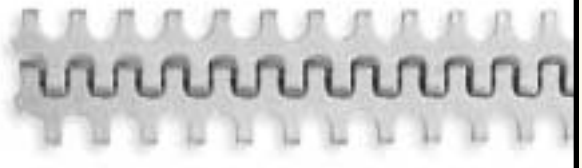
Alligator® Lacing Selection Chart

Lacing Size	For Belts with Mechanical Fastener Ratings up to:		Belt Thickness Range		Recommended Minimum Pulley Diameter		Approximate Corrugated Hinge Pin Diameter	
	kN/m	P.I.W.	mm	in.	mm	in.	mm	in.
00	4,3	25	Up thru 1,6	Up thru 1/16	25	1	1,2	3/64
1	7,8	45	1,6-2,4	1/16-3/32	38	1-1/2	1,6	1/16
7	8,7	50	2,4-3,6	3/32-9/64	51	2	1,6	1/16
15	11,4	65	3,2-4,0	1/8-5/32	64	2-1/2	2,4	3/32
20	16,6	95	4,0-4,8	5/32-3/16	76	3	2,8	7/64
25	17,5	100	4,8-5,6	3/16-7/32	102	4	3,2	1/8
27	17,5	100	5,6-7,1	7/32-9/32	127	5	3,2	1/8
35	26	150	7,1-7,9	9/32-5/16	178	7	3,6	9/64
45	28	165	7,9-9,5	5/16-3/8	229	9	4,8	3/16
55	30	175	9,5-11,1	3/8-7/16	305	12	5,2	13/64
65	35	200	11,1-12,7	7/16-1/2	356	14	5,2	13/64

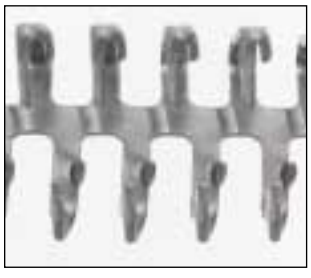
Alligator® Belt Lacing is available for both conveyor belts and transmission belts. Both types are available in steel or Type 316 stainless steel.

Steel: Standard fastener material is suitable for most applications. 00, 1, and 7 lacing is plated for rust and corrosion resistance.

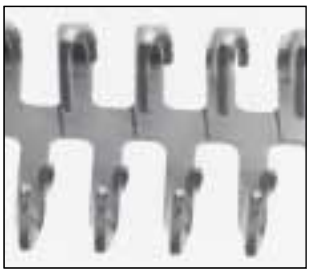
Stainless Steel: Type 316 provides extra resistance to abrasion, magnetic attraction, and corrosion from acids and chemicals. Also excellent for high-sanitary requirements.



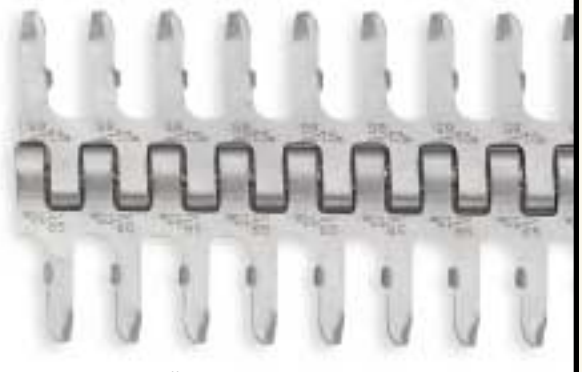
Smallest Size #00 Alligator® Lacing



Conveyor belt lacing:
Features a "radius check" reference point to aid in trimming strips for narrower belt widths. Ideal for belts from 300 mm (12") to 1500 mm (60") wide, and from 0,8 mm (1/32") to 13 mm (1/2") thick.



Transmission belt lacing:
For flat power transmission belts up to 300 mm (12") wide. Lacing is scored, so it can break away to fit belts narrower than packaged size.



Largest Size #65 Alligator® Lacing

Alligator® Belt Lacing Fastener System

Selection Charts

Conveyor Belt Lacing Cartons

Carton includes everything needed for four complete joints: four sets (joints) of lacing, four corrugated hinge pins, and one installation gauge pin with clips.

Fasteners

Steel Lacing with Steel Corrugated Hinge Pins

Belt Width		Ordering Number										
mm	in.	00	1A	7	15	20	25	27	35	45	55	65
300	12	00-12	1A-12	7-12	15-12	20-12	25-12	27-12	35-12	45-12	55-12	65-12
350	14	00-14	1A-14	7-14	15-14	20-14	25-14	27-14	35-14	45-14	55-14	
400	16	00-16	1A-16	7-16	15-16	20-16	25-16	27-16	35-16	45-16	55-16	
450	18	00-18	1A-18	7-18	15-18	20-18	25-18	27-18	35-18	45-18	55-18	65-18
500	20	00-20	1A-20	7-20	15-20	20-20	25-20	27-20	35-20	45-20	55-20	
550	22	00-22	1A-22	7-22	15-22	20-22	25-22	27-22				
600	24	00-24	1A-24	7-24	15-24	20-24	25-24	27-24	35-24	45-24	55-24	65-24
650	26			7-26	15-26		25-26	27-26				
700	28			7-28	15-28	20-28	25-28	27-28				
750	30	00-30	1A-30	7-30	15-30	20-30	25-30	27-30	35-30	45-30	55-30	65-30
800	32			7-32	15-32	20-32		27-32				
900	36	00-36	1A-36	7-36	15-36	20-36	25-36	27-36	35-36	45-36	55-36	65-36
1050	42	00-42	1A-42	7-42	15-42	20-42	25-42	27-42	35-42	45-42	55-42	
1200	48	00-48	1A-48	7-48	15-48	20-48	25-48	27-48	35-48	45-48	55-48	65-48
1350	54						25-54	27-54	35-54			
1500	60	00-60	1A-60	7-60	15-60	20-60	25-60	27-60	35-60	45-60	55-60	65-60

Any lengths over 1500 mm (60") are sold by the set

Fasteners

316 Stainless Lacing with 300 Series Stainless Corrugated Hinge Pins

Belt Width		Ordering Number									
mm	in.	00S	1S	7S	15S	20S	25S	27S	35S	45S	55S
300	12	00S-12	1S-12	7S-12	15S-12	20S-12	25S-12	27S-12	35S-12	45S-12	
350	14	00S-14	1S-14	7S-14	15S-14	20S-14	25S-14	27S-14	35S-14		
400	16	00S-16	1S-16	7S-16	15S-16	20S-16	25S-16	27S-16	35S-16		
450	18	00S-18	1S-18	7S-18	15S-18	20S-18	25S-18	27S-18	35S-18	45S-18	55S-18
500	20	00S-20	1S-20	7S-20	15S-20	20S-20	25S-20	27S-20	35S-20		
600	24	00S-24	1S-24	7S-24	15S-24	20S-24	25S-24	27S-24	35S-24	45S-24	55S-24
700	28			7S-28	15S-28						
750	30	00S-30	1S-30	7S-30	15S-30	20S-30	25S-30	27S-30	35S-30	45S-30	55S-30
900	36	00S-36	1S-36	7S-36	15S-36	20S-36	25S-36	27S-36	35S-36	45S-36	55S-36
1050	42	00S-42	1S-42	7S-42	15S-42	20S-42	25S-42	27S-42		45S-42	
1200	48	00S-48	1S-48	7S-48	15S-48	20S-48	25S-48	27S-48	35S-48	45S-48	55S-48
1350	54		1S-54								
1500	60	00S-60	1S-60	7S-60	15S-60	20S-60	25S-60	27S-60	35S-60		

Extra Hinge Pins

Steel (H) Corrugated Hinge Pins Packages of 10 pins

Belt Width		Ordering Number for Fastener Number:							
mm	in.	00	1 or 7	15	20	25 or 27	35	45	55 or 65
150	6	00H6	1&7H6						
300	12	00H12	1&7H12	15H12	20H12	25&27H12	35H12	45H12	
450	18	00H18	1&7H18	15H18	20H18	25&27H18	35H18		
600	24	00H24	1&7H24	15H24	20H24	25&27H24	35H24	45H24	55&65H24
750	30	00H30	1&7H30	15H30	20H30	25&27H30	35H30		
900	36	00H36	1&7H36	15H36	20H36	25&27H36	35H36	45H36	55&65H36
1200	48	00H48	1&7H48	15H48	20H48	25&27H48	35H48	45H48	55&65H48
1500	60	00H60	1&7H60	15H60	20H60	25&27H60	35H60	45H60	55&65H60

Stainless (SH) Corrugated Hinge Pins – 300 Series Packages of 10 pins

Belt Width		Ordering Number for Fastener Number:						
mm	in.	00	1 or 7	15	20	25 or 27	35	45
300	12		1&7SH12			25&27SH12	35SH12	
450	18		1&7SH18	15SH18		25&27SH18		
600	24	00SH24	1&7SH24	15SH24	20SH24	25&27SH24	35SH24	
750	30		1&7SH30	15SH30	20SH30	25&27SH30	35SH30	
900	36	00SH36	1&7SH36	15SH36	20SH36	25&27SH36	35SH36	45SH36
1200	48	00SH48	1&7SH48	15SH48	20SH48	25&27SH48	35SH48	45SH48
1500	60	00SH60	1&7SH60	15SH60		25&27SH60		

H – Corrugated:
Furnished with all cartons of standard conveyor belt lacing. Available in steel (H) or stainless steel (SH). Additional hinge pin material (nylon-covered steel cable and nylon-covered stainless steel cable) is available in bulk for use with conveyor belt lacing. See page 7 for ordering information.

H – Corrugated

Transmission Belt Lacing

Each box contains fastener sets indicated in the chart below, a steel rocker hinge pin, and one gauge pin.

Fasteners
300 mm (12") strip lengths

Steel		Stainless (Type 316)	
Ordering Number	Sets/ Box	Ordering Number	Sets/ Box
00*	6	00S*	6
1A*	6	1AS*	6
7*	6	7S*	6
15	4	15S	4
20	4	20S	4
25D	4	25DS	4
25G	8		
27K	4	27KS	4
27L	8		
35N	4	35NS	4
45U	4	45US	4
55W	4	55WS	4
65X	4		

*150 mm (6") strip lengths with corrugated hinge pins

Rocker Hinge Pins
20/Package

Ordering Number	
Steel (RH)	Stainless (SRH)
15RH12	
20RH12	20SRH12
	25SRH12
27RH12	
35RH12	
45RH12	
55&65RH12	

RH – Rocker:
Two-piece pin provides rocking action to reduce wear and friction on loops and lacing. Furnished with transmission belt lacing sizes 15 through 65. Available in steel (RH) or stainless steel (SRH). Corrugated pins are furnished with the three smallest transmission sizes.

RH – Rocker

Alligator® Plastic Rivet Fastener System

For applications where metal belt fasteners can't be used, the Alligator® Plastic Rivet Fastener System is a long-lasting, easy-to-install solution for light-duty applications. Our sturdy non-metallic fastener is also a low-cost alternative to the time and expense associated with vulcanization.

Low-profile design

Fastener plate leading edges are beveled to ensure a smooth, low-profile splice. Design permits use on applications with minimum pulley diameters as small as 38 mm (1-1/2") and on belts 0,8 mm to 3,2 mm (1/32" to 1/8") thick.

Easy to maintain

The one-piece, cover-mounted fastener features an integrated design with rivets molded right into the fastener top plate. Fast belt replacement means reduced downtime and increased productivity. Plus, the smooth, flat surface is easy to clean.

Countersunk Rivets

Once set, rivets are countersunk into pre-formed pockets to prevent wear or damage from idlers, pulleys, or slider beds. Beveled leading edges help prevent hang-up and interference with cleaners, plows, or diverters.

Choice of materials

Choose the material that matches your application. UV-resistant black delivers extended life in outdoor applications. FDA-accepted white plastic is suitable for food and pharmaceutical processing applications, and resists weak acids, alkali, hydrocarbons, ester solvents, and alcohols. Both materials can be used in applications from -29°C to 82°C (-20°F to 180°F).

Alligator® Plastic Rivet Fasteners Selection Chart

Fastener Size	For Belts with Mechanical Fastener Ratings up to:		Belt Thickness Range		Recommended Minimum Pulley Diameter		Approximate Hinge Pin Diameter	
	kN/m	P.I.W.	mm	in.	mm	in.	mm	in.
APF100	7	40	Up thru 2,4	Up thru 3/32	38	1-1/2	2,5	.096
APF150	11	65	1,6-3,2	1/16-1/8	75	3	3,5	.136

Fasteners

Includes fasteners and hinge pin to make one splice

Belt Width		Description	Ordering Number
mm	in.		
100			
600	24	White	APF100W-50
1200	48	White	APF100W-100
600	24	Black	APF100B-50
1200	48	Black	APF100B-100
150			
600	24	White	APF150W-50
1200	48	White	APF150W-100
600	24	Black	APF150B-50
1200	48	Black	APF150B-100

Bulk Fasteners

Re-closeable plastic pail contains 500 fasteners – no hinge pins

Description	Ordering Number
White	APF100W-500
Black	APF100B-500
White	APF150W-500
Black	APF150B-500

Hinge Pins

Fastener Size	Length		Ordering Number
	Meter	Foot	
APF100	3	10	NL250-X
APF100	30	100	NL250-C
APF150	3	10	NL350-X
APF150	30	100	NL350-C

Plastic Rivet Lube

Specially formulated to enhance free rivet rotation and reduce component wear.

Ordering Number
PRL4

Alligator® Plastic Rivet Fastener System

Installation Tools

Alligator® Spin-Set™ Installation Tool

Portable tool simplifies plastic rivet installation anywhere in your facility. Weighs only 14 kg (30 lbs.), aligns fasteners automatically, and holds them firmly in place while rivet heads are spin set into countersunk pockets.

Does not include comb assembly, templet, belt punch, curling bit or plastic rivet lube. Purchase separately.

Voltage	Ordering Number
110V	MDT-1
220V-50 cycle	MDT220-1

Comb Assembly

Comb Assembly accommodates both fastener sizes and comes with a gauge pin.

Length		Ordering Number
mm	in.	
300	12	PCA7-300
600	24	PCA7-600

Templets

Easy-to-use templets ensure precise hole locations, as well as correct fastener reachback and alignment.

For APF100 Fasteners			For APF150 Fasteners		
Length		Ordering Number	Length		Ordering Number
mm	in.		mm	in.	
300	12	100T-300	300	12	150T-300
600	24	100T-600	600	24	150T-600
900	36	100T-900	900	36	150T-900
1200	48	100T-1200	1200	48	150T-1200

Belt Punch

Specially designed to drill precisely-sized holes without tearing or burning the belt. Slugs eject automatically to the side.

Fastener Size	Ordering Number
APF100	A100P
APF150	A150P

Curling Bit

Heats, compresses and molds plate stud into a properly curved rivet to optimize holding ability.

Fastener Size	Ordering Number
APF100	S100B
APF150	S150B

Belt Maintenance Products

Clipper® 845LD Belt Cutter

For straight, clean, and safe cuts on belts up to 12 mm (1/2") thick. The shielded, double-edged safety blade can be chain-driven from either end of the cutter. Removable clamp bars hold belts securely. Can be hinged and lifted from either end to simplify routine operation and maintenance.

Belt Widths up to:		Description	Ordering Number
mm	in.		
900	36	36" Belt Cutter	845836LD
1200	48	48" Belt Cutter	845848LD
1500	60	60" Belt Cutter	845860LD
1800	72	72" Belt Cutter	845872LD
Replacement Parts			
Wrench Assembly (handle)			820/840WA
Cutter Blade Kit			845-CBK
Optional Squaring Device			840SD

Alligator® 300 Series Belt Cutter

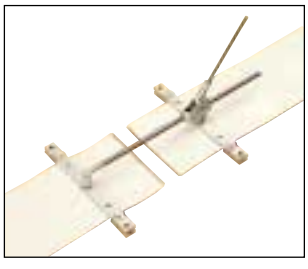
For belts of any width up to 28 mm (1-1/8") thick, the Alligator® 300 Series belt cutter delivers clean, straight cuts quickly and safely. The double-edged blade cuts in either direction. An extra-long blade can also be special ordered for belts up to 39 mm (1-9/16") thick.

Belt Width		Ordering Number
mm	in.	
300	12	300312
450	18	300318
600	24	300324
750	30	300330
900	36	300336
1050	42	300342
1200	48	300348
1500	60	300360

Far-Pul® Light-Duty Belt Clamps

Specially designed steel clamps draw both belt ends together and hold them in perfect alignment to simplify splicing. Each rod accommodates up to 550 mm (22") of adjustment. Can be easily operated by one person. For belts under 30 m (100 ft.) on center.

Belt Width		Ordering Number
mm	in.	
Up to 400	Up to 16	LS1
450-600	18-24	LS2
750-900	30-36	LS2-1/2



Belt Maintenance Products

Flexco® Belt Groover

Easily cuts groove into the belt surface allowing leading edge of the belt splice to "nest" below the belt surface for reduced splice profile. Can also cut a series of grooves to countersink entire splices.

Ordering Number
FBG1

Card Cutter

Heavy-duty utility knife with easy-grip handle.

Ordering Number
GC-1

Rough-Top Belt Skiver

Durable, hand-operated tool for quick and clean removal of rough top from light- and medium-duty conveyor belting. Permits lower fastener installation to minimize splice profile.

Ordering Number
RTBS

Alligator® Hinge Pin Cutter

Cuts bulk hinge pin cable quickly and easily. Provides a clean cut with no frayed ends.

Ordering Number
APC-1

Belt Nippers

Simple tool notches belt ends to eliminate fraying and avoid splice hang-up.

Ordering Number
BN-1

Belt Grinder

The quick, clean way to countersink Alligator® lacing and staple fasteners. Requires only a 10 mm (3/8") electric or pneumatic drill (2,500 rpm). Cuts the belt instead of burning it, so gummy residue is eliminated.

Ordering Number
RB-1

More Light-Duty Solutions from Flexco

The Wire Hook System

Double staggered grip pattern gives wire hooks substantial holding power without degrading the belt carcass integrity. Choose from a wide selection of wire diameters, leg and point lengths, strip lengths, and styles. For a complete Wire Hook catalog, contact your local distributor, Flexco Customer Service, or log on to www.flexco.com.

Unibar® Fasteners

Wire hooks are welded to a common bar and feature our patented Safety Strip which covers hook point to protect user's fingers. Holds hook legs parallel to ease the "meshing" of belt ends and simplify hinge pin insertion.

Carded Hooks

Individual hooks secured on carding paper for easier handling. Works with any application, including bias splices and troughed belt applications.

ClipMark™ Series Fasteners

Designed for mono/multifilament conveyor belting and filter media up to 4 mm (5/32") thick, and for pulleys as small as 24 mm (15/16"). High width-to-height ratio gives ClipMark™ superior mass and strength for increased reliability.

Other Flexco Conveyor Solutions

Flexco® Heavy-Duty Fastener Systems: Hinged and solid plate fasteners for applications up to 263 kN/m (1500 P.I.W.).

Tatch-A-Cleat® Belt Cleats: Easy to install. Choice of specialized compounds make them ideal for wide variety of applications.

Belt Cleaning Products: Complete selection of cleaning solutions includes pre-cleaners, secondary cleaners, and belt plows.

Flex-Lag® Pulley Lagging: Minimize belt slippage with application-matched styles, including conventional rubber and long-wearing ceramic lagging.

Companies that rely on conveyors also rely on Flexco for belt conveyor maintenance solutions that help maximize uptime, productivity, and safety. We offer the most comprehensive selection of quality products in the industry. And we back customers with product and application support second to no one.

For more information, visit our Web site at ***www.flexco.com.***

Or contact us at ***+1-630-971-0150,***

or via fax at ***+1-630-971-1180.***

Flexible Steel Lacing Company
2525 Wisconsin Avenue
Downers Grove, IL 60515-4200 U.S.A.
Telephone: +1-630-971-0150
Fax: +1-630-971-1180
E-mail: advertising@flexco.com
Visit our Web site at: www.flexco.com

Australia: 61-2-9680-3322 • England: 44-1457-891000 • Germany: 49-7428-9406-0 • Mexico: 52-5-674-5326
New Zealand: 64-9-415-4488 • Republic of South Africa: 27-11-974-2771

© 2001 Flexible Steel Lacing Company, 11/01-10, Part#X0784
Alligator®, Clipper®, Far-Pul®, Flexco®, Flex-Lag®, MegAlloy®, Tatch-A-Cleat®, and Unibar® are registered trademarks, and ClipMark™, Ready Set™ and Spin-Set™ are trademarks of Flexible Steel Lacing Company.